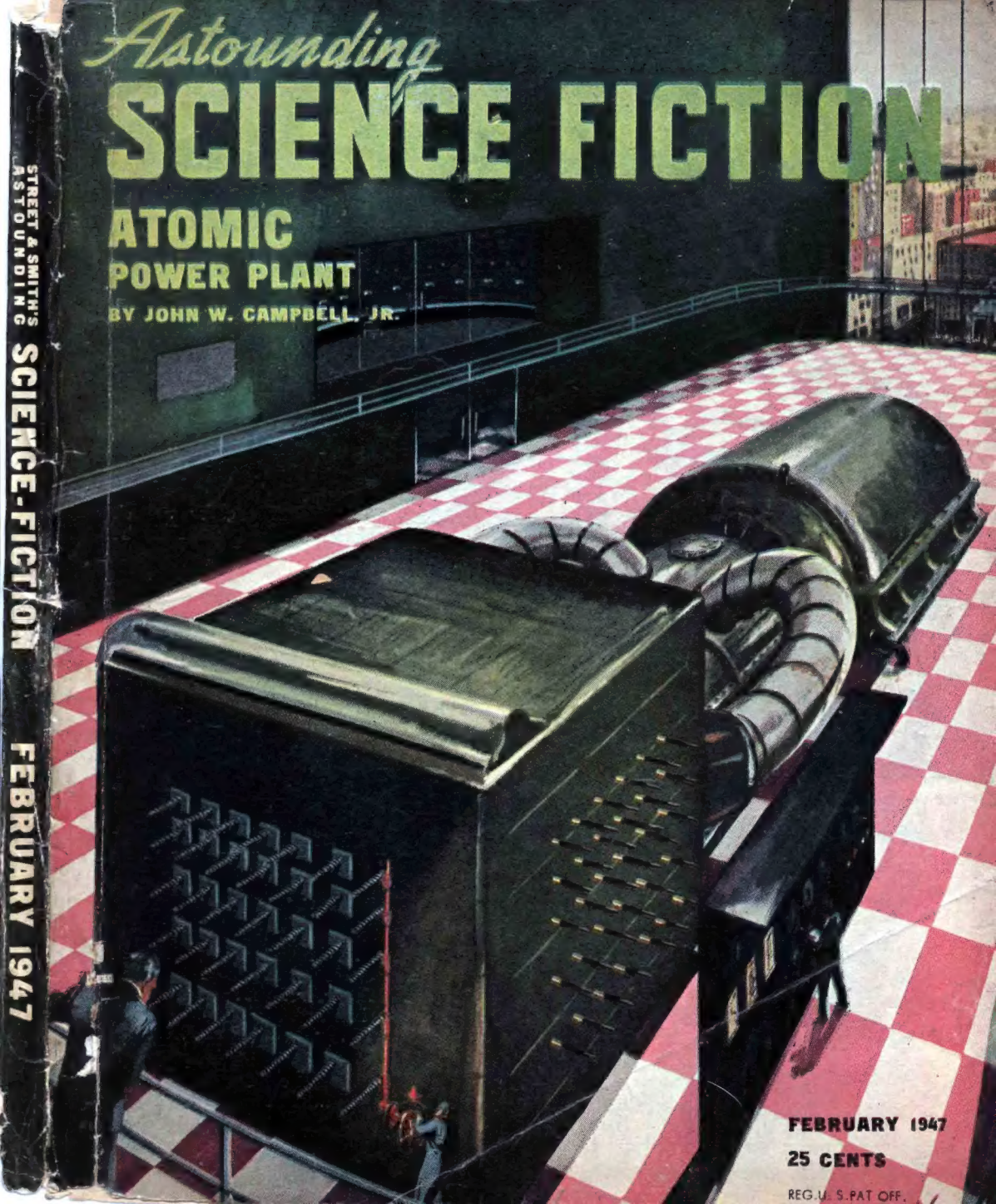
Astounding
SCIENCE FICTION
ATOMIC
POWER PLANT
BY JOHN W. CAMPBELL, JR.
FEBRUARY 1947
25 CENTS
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STREET & SMITH'S ASTOUNDING SCIENCE-FICTION FEBRUARY 1947

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TOP ROW, left to right: Pneumococcus Type III, Pneumococcus Type IV, Streptococcus viridans, Friedlander's bacillus. BOTTOM ROW, left to right: Streptococcus hemolyticus, Bacillus influenzae, Micrococcus catarrhalis, Staphylococcus aureus.

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CONTENTS

FEBRUARY, 1947 VOL. XXXVIII, NO. 6

NOVELETTE

MATURITY, *by Theodore Sturgeon* 7

SHORT STORIES

EYE TO THE FUTURE, *by Ree Dragonette* . . 51
PETE CAN FIX IT, *by Raymond F. Jones* . . . 64
THE ANSWER, *by George O. Smith* 84
THE TIMID TIGER, *by Eric Frank Russell* . . 121

SERIAL

TOMORROW AND TOMORROW, *by Lewis Padgett* 140
(*Conclusion*)

ARTICLE

ATOMIC POWER PLANT, *by John W. Campbell, Jr.* 99

READERS' DEPARTMENTS

THE EDITOR'S PAGE 5
BRASS TACKS 92
IN TIMES TO COME 120

COVER BY SNIFFEN

Illustrations by Cartier, Orban and Swenson

Editor
JOHN W. CAMPBELL, JR.

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RECONVERSION AT OAK RIDGE

One of the very special attributes of an atomic pile is its absolute permanence, so far as man is concerned. Once an atomic pile has been built, and set into high-level operation, it can never be disassembled, moved, changed, or otherwise altered by men. It becomes radioactive — radioactive to a fantastic and utterly unapproachable degree. Only while the massive shielding remains intact around it can any living thing approach it.

The most famous of all atomic piles—the West Stands Pile, under the football stadium stands in Chicago, the first atomic pile on Earth —has been disassembled and carted away. Because that was originally intended, the West Stands pile was never allowed to reach a level of operation higher than two hundred watts — which is a decidedly low-energy concentration in the many, many tons of material involved. Even this level was maintained for only a brief time. During most of its operating career, the West Stands pile was operated at about one-half watt—slightly more vigorous than a pen-light type flashlight.

The second pile built was the experimental pile at Oak Ridge — the Clinton Pile. It was intended to be a pilot-plant for the great production piles at Hanford, and to serve for experimental work on the physics of the atomic bomb, and uranium fission. It was designed for the military purposes of the Manhattan Project. It can not be altered; it will be thousands of years before the radioactivity of that mass of material will be reduced to a point humans can approach, even if the pile is never operated again. The Hanford piles, even more specialized than the Clinton Pile, can be used only for plutonium production; they, too, can not be altered.

At Argonne, the Chicago suburb, a research pile was set up—the only one using heavy-water instead of graphite as a moderator — and the Argonne Pile was designed for greater flexibility. That is the only true research tool atomic pile in the world. It is because of that limitation that new research piles must be built, and are now being built under the Atomic Control Commission's authority.

The Oak Ridge pile is being used now to produce radioactive isotopes for research, but its utility in this respect is strictly limited. Because the original intention had been military research, the fission products of the pile's operation are separated by automatic machinery—which is designed to dispose of them, not to salvage them. Apparently they cannot be recovered. Fission product isotopes produced for sale to research

institutes are produced by putting uranium slugs into the special bombardment test-openings, not by recovery from the operating uranium slugs of the pile itself.

For maximum plutonium production, a pile must be designed so that all available excess neutrons produced by fissioning atoms will be absorbed by U-238 atoms present in the fuel-slugs. For maximum control safety, the pile should be so designed that, even with the control-rod dampers — which control the pile by absorbing neutrons when they are inserted — withdrawn completely, the pile reaction will accelerate only slowly. The design, then, will make it possible to stop the pile almost immediately, but the start will be slow. To achieve this condition is easy; arrange that the U-238 present will absorb almost all the available neutrons, so that even a slight loss of neutrons to the absorption in control rods will damp the reaction. In other words, design the pile so that it can just barely work under the most favorable conditions.

This design assures maximum plutonium production and maximum control safety.

Unfortunately, it makes it very difficult to do much isotope production! If the isotope production wanted is the highly valuable C^{14}, the process calls for neutron absorption in N^{14}. But if many neutrons are absorbed in nitrogen atoms, this absorption will damp the pile reaction as effectively as would inserting the control rods. Since practically all the most effective transmutation reactions to produce radioisotopes are neutron-absorption reactions, practically all isotope production is stringently limited by the design of the Clinton Pile as a plutonium producer.

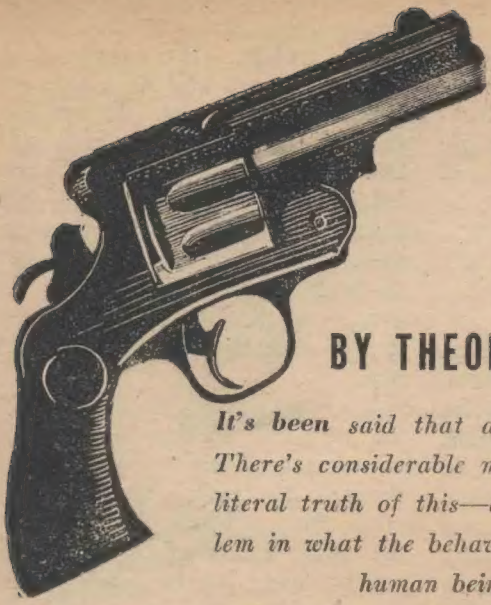
The rest of Oak Ridge's facilities—the isotope separation plants—are a different subject. The reconversion problems there are different, but only slightly less complex.

These facilities consist of two types of isotope separation mechanism; the U-235 separation by diffusion through porous barriers, and the electromagnetic calutron separation system. The porous barrier separation system is more flexible than the atomic pile only in that it can be torn down and rebuilt from the ground up—something you can't do with a pile. But it isn't practicable to do anything else with it.

The calutrons, on the other hand, offer immense possibilities. Since they are, in essence, mass-production type mass spectrographs, they can, by a simple adjustment of the electrode potentials and the magnetic field, be readjusted to separate other isotopes. In particular, though the range of adjustment of any calutron is decidedly limited, only the relatively small and simple electrode system need be rebuilt to accommodate other ranges of adjustment. Calutrons can be altered one by one, so that each of the many units at Oak Ridge can be applied to a different type of task if desired.

Discussion of the important possibilities of this work will have to wait for more space.

THE EDITOR.



MATURITY

BY THEODORE STURGEON

It's been said that a man never grows up. There's considerable medical evidence for the literal truth of this—and a fascinating problem in what the behavior of a truly matured human being would be.

Illustrated by Swenson

Dr. Margaretta Wenzell, she of the smooth face and wise eyes and flowing dark hair, and the raft of letters after her name in the medical "Who's Who," allowed herself to be called "Peg" only by her equals, of whom there were few. Her superiors did not, and her inferiors dared not. And yet Dr. Wenzell was not a forbidding person in any way. She had fourteen months to go to get to her thirtieth birthday; her figure hadn't changed since she was seventeen, and her face, while hardly suited for a magazine cover, was a natural for a salon study. She maintained her careful distance from most people for two reasons. One was that, as a gland specialist, she had to make a fetish of objectivity; and the other was the fact that only by a consistent attitude of impersonality could she keep her personal charm from being a drawback to her work. Her work meant more to her than anything else in life, and she saw to it that her life stayed that way.

And yet the boy striding beside her called her "Peg." He had since he met her. He was neither her superior nor her inferior, and he was certainly not her equal. These subconscious divisions of Dr. Wenzell's had nothing to do with age or social position. Her standards were her own, and since Robin English could not be judged by any of them—or by anyone else's standards, for that matter—she had made no protest beyond a

lift of the eyebrow. It couldn't be important.

He held her arm as they crossed the rainy street. He always did that, and he was one of the half-dozen men she had met in her life who did it unconsciously and invariably.

"There's a taxi!" she said.

He grinned. "So it is. Let's take the subway."

"Oh, Robin!"

"It's only temporary. Why, I've almost finished that operetta, and any day now I'll get the patent on that power brake of mine, and—" He smiled down at her. His face was round and ruddy, and it hadn't quite enough chin, and Peg thought it was a delightful face. She wondered if it knew how to look angry or—purposeful.

"I know," she said. "I know. And you'll suddenly have bushels of money, and you won't have to worry about taxis—"

"I don't worry about 'em anyhow. Maybe such things'll bother me when your boy friend gets through with me."

"They will, and don't call him my boy friend."

"Sorry," he said casually.

They went down the steps at the subway terminal. Sorry. Robin could always dismiss things with that laconic expression. And he *could*. Whether he was sorry or not wasn't important, somehow; it was the way he said it. It reduced the thing he was sorry for to so little value that it wasn't worth being sorry about.

Peg stood watching him as he swung up to the change booth. He walked easily, with an incredible grace. As graceful as a cat, but not at all like a cat. It was like the way he thought—as well as a human being, but not like a human being. She watched the way the light fell on his strange, planeless, open face, and his tousled head of sandy horsehair. He annoyed her ever so much, and she thought that it was probably because she liked him.

He stood aside to let her through the turnstile, smiling at her and whistling a snatch of a Bach fugue through his teeth. That was another thing. Robin played competent piano and absolutely knocked-out trumpet; but he never played the classics. He never whistled anything else.

There was no train in. They strolled up the platform slowly. Peg couldn't keep her eyes off Robin's face. His sensitive nostrils dilated, and she had the odd idea that he was smelling a sound—the echoing shuffle of feet and machinery in the quiet where there should be no quiet. As they passed the massive beam-and-coil-spring bumper at the end of the track, Robin paused, his eyes flicking over it, gauging its strength, judging its materials. It had never occurred to her to look at such a thing before. "What does *that* matter to you, Robin?"

He pointed. "First it knocks the train pigeontoed. Then she'll nose into the beam there and the springs

behind it will take up the shock. Now why do they use coils?"

"Why not?"

"Leaf springs would absorb the collision energy between the leaves, in friction. Coil springs store the energy and throw it right back . . . oh! I see. They took for granted when they designed it that the brakes would be set. Big as those springs are, they're not going to shove the whole train back. And then, the play between the car couplings would—"

"But Robin—what does it matter? To you, I mean. No," she said quickly as a thick little furrow appeared and disappeared between his eyes. "I'm not saying you shouldn't be interested. I'm just wondering exactly what it is about such devices that fascinates you so."

"I don't know," he said. "The . . . the integration, I suppose. The thought that went into it. The importance of the crash barrier to Mrs. Scholtz's stew and Sadie's date, and which ferry Tony catches, and all the other happenings that can happen to the cattle and gods that use the subways."

Peg laughed delightedly. "And do you think about all of the meanings to all of the people of all of the things you see?"

"I don't have to think of them. They're there, right in front of me. Surely you can see homemade borscht and a good night kiss and thousands of other little, important things, all wrapped up in those big helical springs?"

"I have to think about it. But I do see them." She laughed again. "What do you think about when you listen to Bach?"

He looked at her quickly. "Did I say I listened to Bach?"

"My Gestapo told me." She looked at him with puzzlement. He wasn't smiling. "You whistle it," she explained.

"Do I? Well, all right then. What do I think of? Architecture, I think. And the complete polish of it. The way old J. S. burnished every note, and the careful matching of all those harmonic voices. And . . . and—"

"And what?"

He laughed, a burst of it, a compelling radiation which left little pieces of itself as smiles on the faces of the people around them. "And the sweating choirboys who had to pump the organ when he composed. How they must have hated him!"

A train came groaning into the station and stopped, snicking its doors open. "Watch them," said Robin, his quick eyes taking inventory of the people who jostled each other out of the train. Not one in fifty is seeing anything. No one knows how far apart these pillars are, or the way all these rivets are set, or the cracks in the concrete under their feet. They're all looking at things separated from them in space and time—the offices they have left, the homes they're going to, the people they will see. Hardly any of them are consciously here, *now*. They're all ghosts, and we're a couple of Peeping Toms."

"Robin, Robin, you're such a *child!*"

"To you, of course. You're older than I am."

"Four days." It was a great joke between them.

"Four thousand years," he said soberly. They found a seat. "And I'm not a child. I'm a hyperthymus. You said so yourself."

"You won't be for very much longer," said Dr. Margaretta Wenzell. "Dr. Warfield and I will see to that."

"What are you doing it for?"

"You'll find out when we send the bill."

"I know it isn't that."

"Of course not," she said. Her remark tasted badly in her mouth. "It's just . . . Robin, how long have you had that suit?"

"Uh . . . suit?" He looked vaguely at the sleeve. "Oh, about three years. It's a good suit."

"Of course it is." It was, too. She remembered that he had gotten it with prize money from a poetry contest. "How many weeks room rent do you owe?"

"None!" he said triumphantly. "I rewired all the doorbells in the apartment house and fixed Mrs. Gridget's vacuum cleaner and composed a song for her daughter's wedding reception and invented a gadget to hold her cook book under the kitchen shelf, with a little light that goes on when she swings it out. Next thing I knew she handed me a rent receipt. Wasn't that swell of her?"

"Oh," said Peg weakly. She clutched grimly at the point she was trying to make. "How much are you in debt?"

"Oh, that," he said.

"That."

"I guess ten-twelve thousand." He looked up. "Kcans Yppans. What are you driving at?"

"*What* did you say?"

He waved at the car card opposite. "Snappy Snack. Spelled backwards. Always spell things backward when you see them on the car cards. If you don't, there's no telling what you might miss."

"Oh, you blithering *idiot!*"

"Sorry. What were you saying?"

"I was getting to this," she said patiently. "There doesn't seem to be anything you can't do. You write, you paint, you compose, you invent things, you fix other things, you—"

"Cook," he said, as she stopped for breath; and he added idly, "I make love, too."

"No doubt," said the gland specialist primly. "On the other hand, there doesn't seem to be anything you've accomplished with all of these skills."

"They're not skills. They're talents. I have no skills."

Peg saw the distinction, and smiled. It was quite true. One had to spend a little time in practice to acquire a skill. If Robin couldn't do promisingly the first time he tried something, he would hardly try again. "A good point. And that is what Dr. Warfield and I want to adjust."

"Adjust, she says. Going to

shrivel up all the pretty pink lobulae in my thymus. The only thymus I've got, too."

"And about time. You should have gotten rid of it when you were thirteen. Most people do."

"And then I'll be all grim and determined about everything, and generate gallons of sweat, and make thousands of dollars, so that at age thirty I can go back to school and get that high school diploma."

"Haven't you got a high school diploma?" asked Peg, her appalled voice echoing hollowly against her four post-graduate degrees.

"As a senior," smiled Robin, "I hadn't a thing but seniority. I'd been there six years. I didn't graduate from school; I was released."

"Robin, that's *awful!*"

"Why is it awful? Oh—I suppose it is." He looked puzzled and crestfallen.

Peg put her hand on his arm. It had nothing to do with logic, but something in her was wrenched when Robin looked hurt. "I suppose it doesn't matter, Robin. What you learn, and what you do with it, are really more important than *where* you learn."

"Yes . . . but not *when*. I mean, you can learn too late. I know lots of things, but the things I don't know seem to have to do with getting along in the world. Isn't that what you mean by 'awful'? Isn't that what you and Dr. Warfield are going to change?"

"That's it. That's right, Robin. Oh, you're such a strange person!"

"Strange?"

"I mean . . . you know, I was sure that Mel Warfield and I would have no end of trouble in persuading you take these thymus treatments."

"Why?"

With a kind of exasperation she said, "I don't think you fully realize that the change in you will be drastic. You're going to lose a lot that's bad about you—I'm sure of that. But you'll see things quite differently. You . . . you—" She fought for a description of what Robin would be like without his passionate interest in too many things, and her creative facilities bogged down. "You'll probably see things quite differently."

He looked into her eyes thoughtfully. "Is that bad?"

Bad? There never was a man who had less evil about him, she thought. "I think not," she said.

He spread his hands. "I don't think so either. So why hesitate? You have mentioned that I do a lot of things. Would that be true if I got all frothed up every time I tried something I'd never tried before?"

"No. No, of course not." She realized that it had been foolish of her to mix ordinary practical psychology into any consideration of Robin English. Obviously gland imbalances have frequent psychological symptoms, and in many of these cases the abnormal condition has its own self-justifying synapses which will set up a powerful

defense mechanism when treatment is mentioned. Equally obviously, this wouldn't apply to Robin. Where most people seem to have an inherent dislike of being changed, Robin seemed to have a subconscious yearning for just that.

He said, "We get off at the next station."

"I know."

"I just wanted to tell you."

"Where to get off?"

In utter surprise, he said "Me?" and it was the most eloquent monosyllable she had ever heard. For the first time it occurred to her to wonder consciously what he thought of her. It hadn't seemed to matter, before. What was she, in his eyes? She suddenly realized that she, as a doctor meeting a man socially, had really no right to corner him, question him, analyze and diagnose the way she had over the past few weeks. She couldn't abide the existence of a correctible condition in her specialty, and it was probably the essence of selfishness for her to do it. He probably regarded her as meddling and dominating. She astonished herself by asking him, point-blank.

"What do I think of you?" He considered, carefully. He appeared not to think it remarkable that she could have asked such a question. "You're a taffy-puller."

"I'm a what?"

"A taffy-puller. They hypnotize me. Didn't you ever see one?"

"I don't think so," she breathed. "But—"

"You see them down on the boardwalk. Beautifully machined little rigs, all chrome-plated eccentrics and cams. There are two cranks set near each other so that the 'handle' of each passes the axle of the other. They stick a big mass of taffy on one 'handle' and start the machine. Before that sticky, homogeneous mass has a chance to droop and drip off, the other crank has swung up and taken most of it. As the crank handles move away from each other the taffy is pulled out, and then as they move together again it loops and sags; and at the last possible moment the loop is shoved together. The taffy welds itself and is pulled apart again." Robin's eyes were shining and his voice was rapt. "Underneath the taffy is a stainless steel tray. There isn't a speck of taffy on it. Not a drop, not a smidgin. You stand there, and you look at it, and you wait for that lump of guff to slap itself all over those roller bearings and burnished con rods, but it never does. You wait for it to get tired of that fantastic juggling, and it never does. Sometimes gooey little bubbles get in the taffy and get carried around and pulled out and squashed flat, and when they break they do it slowly, leaving little soft craters that take a long time to fill up; and they're being mauled around the way the bubbles were." He sighed. "There's almost too much contrast—that competent, beautiful machinist's dream handling what? Taffy—no definition, no boundaries, no predictable tensile strength. I feel somehow as if there ought to

be an intermediate stage somewhere. I'd feel better if the machine handled one of Dali's limp watches, and the watch handled the mud. But that doesn't matter. How I feel, I mean. The taffy gets pulled. You're a taffy-puller. You've never done a wasteful or incompetent thing in your life, no matter what you were working with."

She sat quietly, letting the vivid picture he had painted fade away. Then, sharply, "Haven't I!" she cried. "I've let us ride past our station!"

Dr. Mellett Warfield let them in himself. Towering over his colleague, he bent his head, and the light caught his high white forehead, which, with his peaked hairline, made a perfect Tuscan arch. "Peg!"

"Hello, Mel. This is Robin English."

Warfield shook hands warmly. "I *am* glad to see you. Peg has told me a lot about you."

"I imagine she has," grinned Robin. "All about my histones and my albumins and the medullic and cortical tissues of my lobulae. I love that word. Lobulae. I lobule very much, Peg."

"Robin, for Pete's sake!"

Warfield laughed. "No—not only that. You see, I'd heard of you before. You designed that, didn't you?" He pointed. On a side table was a simple device with two multicolored disks mounted at the ends of a rotating arm, and powered by a little electric motor.

"The Whirltoy? Robin, I didn't know that!"

"I don't know a child psychologist or a pediatrician who hasn't got one," said Warfield. "I wouldn't part with that one for fifty times what it cost me—which is less than it's worth. I have yet to see the child, no matter how maladjusted, glandular, spoiled, or what have you, who isn't fascinated by those changing colors. Even the color-blind children can't keep their eyes off it because of the changing patterns it makes."

Peg looked at Robin as if he had just come in through the wall. "Robin . . . the patent on that—"

"Doesn't exist," said Warfield. "He gave it to the Parent's Association."

"Well, sure. I made mine for fun. I had it a long time before a friend of mine said I ought to sell the idea to a toy manufacturer. But I heard that the Parent's Association sent toys to hospitals, and I sort of figured maybe kids that needed amusement should have it, rather than only those whose parents could afford it."

"Robin, you're crazy. You could have—"

"No, Peg," said Warfield gently. "Don't try to make him regret it. Robin . . . you won't mind if I call you Robin . . . what led you to design the rotors so that they phase over and under the twentieth-of-a-second sight persistence level, so that the eye is drawn to it and then the mind has to concentrate on it?"

"I remember Zeitner's paper about that at the Society for Men-

tal Sciences," said Peg in an awed tone. "A brilliant application of optics to psychology."

"It wasn't brilliant," said Robin impatiently. "I didn't even know that that was what it was doing. I just messed with it until I liked it."

A look passed between Warfield and Peg. It said, "What would he accomplish if he ever really tried?"

Warfield shook his head and perched on the edge of a table. "Now listen to me, Robin," he said, gently and seriously. "I don't think Peg'll mind my telling you this; but it's important."

Peg colored slightly. "I think I know what you're going to say. But go ahead."

"When she first told me about you, and what she wanted to try, I was dead set against it. You see, we know infinitely more about the ductless glands nowadays than we did—well, even this time last year. But at the same time, their interaction is so complex, and their functions so subtle, that there are dozens of unexplored mysteries. We're getting to them, one by one, as fast as they show themselves and as fast as we can compile data. The more I learn about the ductless glands, the less I like to take chances with them. When Peg just told me about you as a talented young man whose life history was a perfect example of hyper-thymus —immaturity, I think was the word she used—"

"Da! Also goo!" laughed Robin. "She might have been kind enough to call it, say, a static precociousness."

"Please don't tease me about it. Robin."

"Oh. Sorry. Go on, Mel." Peg smiled at the way Warfield's eyebrows went up. She had done the same thing, for the same reason, the first time Robin called her "Peg."

"Anyhow, I certainly had no great desire to follow her suggestion —shoot you full of hormones and sterones to help you reorganize your metabolism and your psychology. After all, interesting as these cases are, a doctor has to ration his efforts. There are plenty of odd glandular situations walking around in the guise of human beings. In addition, I had no personal interest in you. I have too much work to do to indulge a Messiah complex.

"But Peg got persistent. Peg can be *very* persistent. She kept bringing me late developments. I didn't know whether you were a hobby or an inverted phobia of hers. With some effort I managed to remain uninterested until she brought me those blood analyzes."

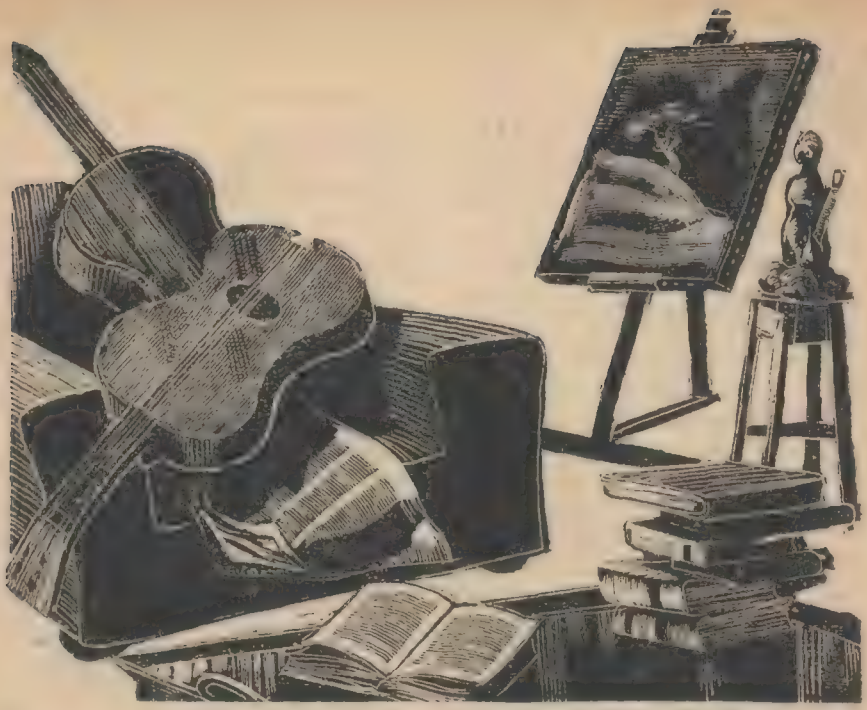
"I'll never get over my disappointment about what she did with those blood specimens," said Robin soberly.

"Disappointment? Why?"

"I had hoped she was a vampire."

"Go on, Mel. Don't try to keep up with him."

"It wasn't until I found out that you wrote 'The Cellophane Chalice' —and mind you, I never did like



poetry, but that was *different*—and that you also"—he ticked them off on his fingers—"wrote the original continuity for that pornographic horror of a comic strip 'Gertie and the Wolves,' did the pipe-cleaner figurines that were photographed to illustrate 'The Tiny Hans Anderson,' dropped a sackful of pine oil into the fountain at Radio City purely because you wanted to see thirty thousand gallons of bubbles, got thrown in the pen for it and while there saved the lives of two prisoners and a guard by slugging it out with a homicidal maniac in the bull pen; composed 'The Lullaby Tree' . . . by the way, how was it Rollo Vincente got all the credit—and the money—for that song? It was Number One on the hit list for sixteen weeks."

"He did a swell job," said Robin. "He wrote it down for me."

"Robin can't read music," Peg said tiredly.

"Oh Lord," said Warfield reverently. "I also learned that you invented that disgusting advertising disease 'Stoplight Acne' and gave it for free to an advertising copywriter—"

"Who is now making twenty thousand a year," said Peg.

"The guy was desperate," said Robin. "Besides, he gave me my gold trumpet."

"Which is in hock," said Peg.

"Oh, why go on?" said Warfield. "Most important, I learned that you didn't eat regularly, that you suffered from recurrent eviction, that you continually give away your possessions, including your overcoats, with such bland illogic that once you spent four months in the hospital with pneumonia and complications—"

"Four winter months, I might point out," said Robin. "So help me, I don't know how I'd have gotten through that winter otherwise. That was well worth the price of an overcoat."

"So Peg began to make a social issue of it. She said that you were a fountainhead of art, science, and industry and that the dispersal of your talents was a crime against humanity. At this stage I would be inclined to agree with her even if she weren't, Peg." Warfield looked at the girl, and the way he did it made Robin raise his eyebrows.

"So now that we have your cooperation, we'll go ahead, for the greater honor and glory of humanity and creative genius, as Dr. Wenzell here once phrased it. But I want you to thoroughly understand that although there is every chance of success, there might be no result at all, or . . . or something worse."

"Like what?"

"How do I know?" said Warfield sharply, and only then did Peg realize what a strain this was to him.

"You're the doctor," said Robin. Suddenly he walked up to Warfield and touched his chest gently. He smiled. He said, "Mel, don't worry. I'll be all right."

Peg's emotional pop-valve let go a hysterical giggle. Warfield turned abruptly away and roughly tore a drawer open and pulled out a thin sheaf of documents. "You'll have to sign these," he said roughly. "I'm going to get the solutions ready. Come on, Peg."

In the laboratory, Peg leaned weakly against the centrifuge. "Don't worry, Mel," she quoted mistily.

"From the time of Hippocrates," growled Warfield, "it has been the duty and practice of the physician to do everything in his power to engender confidence in the patient. And he—"

"Made you feel better."

After a long pause Warfield said, "Yes, he did."

"Mel, I think he's right. I think he *will* be all right. I think that what he has can't be killed. There's too *much* of it!"

She suddenly noticed that Warfield's busy hands had become still, though he didn't turn to look at her. He said "I was afraid of that."

"What?"

"Oh, I—skip it."

"Mel, what's the matter?"

"Nothing of any importance—especially to you. It's just the way you talk about Robin . . . the way your voice sounds—"

"That's utterly ridiculous!"

Warfield chuckled a little. "Not that I can blame you. Really I can't.

That boy has, without exception, the most captivating—"

"Mel, you're being offensive. You certainly know me well enough to know that my interest in Robin English is purely professional—even if I have to include the arts among the professions. Personally he doesn't appeal to me. Why, he's a *child!*"

"A situation which I shall adjust for you."

"That was the n-nastiest thing anyone ever said to me!" she blazed.

"Oh, Peg." He came to her, wiping his hands on a towel. He threw it away—a most uncharacteristic gesture, for him—and put his hands gently on her shoulders. She would not meet his eyes. "Your lower lip is twice as big as it ought to be," he said softly. "I am sorry, darling."

"Don't call me darling."

"I lost my good sense. May I ask you to marry me again?"

"M-marry me again?"

"Thank the powers for that sense of the ridiculous! May I ask you again? It's about time."

"Let's see—what is the periodicity? You ask me every nineteen days, don't you?"

"Aloud," he said gravely.

"I—" At last she met his eyes. "No. No! Don't talk about it!"

He took his hands off her shoulders. "All right, Peg."

"Mel, I wish you wouldn't keep bringing this up. If I ever change my mind, I'll speak up."

"Yes," he said thoughtfully. "I believe you would."

"It's just that you— Oh Mel, everything's so balanced now! My work is finally going the way I want it to go, and I just don't *need* anything else." She held up a hand, quickly. "If you say anything about ductless glands I'll walk out of here and *never* see you again!"

"I won't, Peg."

There was a strained silence. Finally Peg said, "Are you almost ready?"

Mel nodded and went back to the bench. "You can bring him in now."

Peg went out into the reception office. Something white and swift swished past her face, went rocketing up into the corner of the ceiling, hovered, and then drifted down to the floor in slow spirals. "What in—"

"Oh— Sorry, Peg," Robin said, grinning sheepishly. He went and picked up the white object, and held it out to her. "Tandem monoplane," he explained. "The Langley principle. If Langley had only had a decent power plant, aviation history would have been drastically different. The thing is really airworthy."

"Robin, you're impossible. Mel's ready. Where's the thing he asked you to sign?"

"Hm-m-m? Oh, that—this is it."

"You made that airplane out of it?"

"Well, I wanted to see if I could do it without tearing the paper. I did too." He disassembled the aircraft busily, and smoothed the papers. "They're all right, see?"

"I ought to make you stand in the corner," she said, half angrily.

"O.K. It's a long time till Christmas. You won't hold that over my head."

She looked at him and suddenly, violently, resented Mel for what he had intimated. "Come on, Robin," she said softly. She took his hand and led him into the laboratory.

"Sit down, Robin," said Warfield without looking up.

"Per—dition!" said Robin, wide-eyed. "You've got more glassware here than the Biltmore Bar. As the hot, cross Bunsen said to the evaporator, 'Be still, my love.'"

Peg moaned. Warfield said "And what did the evaporator say to that?"

"'Thank you very much.' You see," said Robin solemnly, "It was a retort courteous."

"Do you think," gasped Peg, "that we'll be able to put a stop to that kind of thing with these treatments?"

"I'm afraid not," said Robin instantly. "The generation of puns is not a phenomenon of the immature mind. The repetition of them is."

"There is probably a flaw in that," said Peg. "I have my hopes, anyway."

"Of course there's a flaw in it. But didn't it sound nice?"

"Here," said Warfield, handing him a glass. "Bottoms up."

Robin rose, accepted the glass, bowed from the waist, and said, "Well, here's to champagne for my real friends and real pain for my sham friends. Exit wastrel." And he drained the glass.

"Now if you'll rope him and throw him," said Warfield, approaching with a hypodermic. Robin sat, quite relaxed, as the needle sank into his arm.

"Never felt a thing," he said briskly, and then collapsed on the floor. Peg caught his head before it could strike, and lowered it gently. Kneeling beside him, she took his wrist. His pulse felt as if it had lost its flywheel.

"Post-pituitary syncope," said Warfield. "I half expected that. He'll be all right. It's compensated for. There just isn't any way of slowing down neopituitrin. Watch what happens when the pineal starts kicking up."

Peg suddenly clutched at the limp wrist. "He's . . . he's— Oh Mel, it's stopped."

"Hang on, Peg. Just a few more seconds, and it should—"

Under Peg's desperate fingers, the pulse beat came in full and strong, as suddenly as if it had been push button tuned. With it, Peg began to breathe again. She saw Warfield wipe his eyes. Sweat, probably.

Robin's eyes opened slowly, and an utterly beatific expression crossed his face. He sighed luxuriously. "Beautiful," he said clearly.

"What is it, Robin?"

"Did you see it? I never thought of that before. It's the most perfectly functional, aesthetically balanced thing produced by the mind of man." Sheer wonder suffused his face. "I *saw* one!"

"What was it?"

"A baseball bat!"

Warfield's chin came up. "Well I'll be . . . Peg, don't laugh." Peg

was hardly likely to. "You know, he's about right?"

"I'll think about aesthetics later," said Peg with some heat. "Is he going to be all right?"

"That's all of the immediate reactions that I suspected. There'll be some accelerated mental states—melancholia and exuberance alternating pretty rapidly and pretty drastically. He'll have to have some outlet for stepped-up muscular energy. Then he'll sleep."

"I'm glad it's over."

"Over?" said Warfield, and went out. She called after him, but he went straight out the office door.

Robin sat up and shook his head violently. "How did—"

Peg took his upper arm. "Sit up, Robin. Up and go." She raised him, but instead of regaining the chair he rose and pulled away from her. He paced rapidly down the laboratory, turned and came back. His face held that pitiable, puzzled look, with the deep crease between his brows. He walked past her, his eyes distant; then he whirled suddenly on her. His smile was brilliant. "Peg!" he shouted. "I didn't expect to see you here!" His eyes drifted past her face, gazed over her shoulder, and he turned and looked around the walls. "Where, incidentally, is 'here'?"

"Dr. Warfield's. Mel's laboratory."

"Mel. Oh . . . Mel. Yes, of course. I must be getting old."

"Perhaps you are."

He put his hand on his chest, just below his throat. "What would my thymus be doing about now? Trying to think of something quotable to say as its last words?"

"It may be some time," she smiled. "But I imagine it's on its way out. Get your coat on. I'll go home with you."

"What on earth for?"

She considered, and then decided to tell him the truth. "You're full of sterones and hormones and synthetic albuminoids, you know. It isn't dangerous, but glandular balance is a strange thing, and from the treatment you just got you're liable to do anything but levitate—and knowing you," she added, "even that wouldn't surprise me."

"Gosh. I didn't realize that I might be a nuisance to people."

"You didn't realize . . . why, there was a pretty fair list of possibilities of what might happen to you in that release you signed."

"There was? I didn't read it."

"Robin English, I *don't* know what I'm supposed to do with you."

"Haven't you already done it?" He shrugged. "What's the odds? Mel said I'd have to sign it, and I took his word for it."

"I wish," said Peg fervently, "that I could guarantee the change in your sense of values the way I can the change in your hormone adjustment. You're going to have to be educated! And let this be the first lesson—*never* sign anything without reading it first! What are you laughing at, you idiot?"

"I was just thinking how I would stall things if I go to work for some big outfit and have to sign a payroll," he chuckled.

"Get your coat," said Peg, smiling. "And stop your nonsense."

They took a taxi, after all. In spite of Robin's protests, Peg wouldn't chance anything else after Robin:

Nearly fainted on the street from a sudden hunger, and when taken to a restaurant got petulant to the point of abusiveness when he found there was no tabasco in the place, advancing a brilliant argument with the management to the effect that they should supply same to those who desire it even if what the customer *had* ordered was four pieces of seven-layer cake.

Ran half a block to give a small boy with a runny nose his very expensive embroidered silk handkerchief.

Bumped into a lamp-post, lost his temper and swung at it, fracturing slightly his middle phalanx annularis.

Indulged in a slightly less than admirable remorseful jag in which he recounted a series of petty sins—and some not so petty at that—and cast wistful eyes at the huge wheels of an approaching tractor-trailer.

Went into gales of helpless laughter over Peg's use of the phrase "Signs of the times" and gaspingly explained to her that he was suffering from sinus of the thymus.

And the payoff—the instantaneous composition of eleven verses of an original song concerning one "Stella with the Springy Spine" which was of a far too questionable nature for him to carol at the top of his voice the way he did. She employed a firmness just short of physical force and at last managed to bundle him into a cab, in which he could horrify no one but the driver, who gave Peg a knowing wink which infuriated her.

After getting in his rooms—a feat which required the assistance of Landlady Gridget's passkey, since he had lost his, and the sufferance of a glance of wild surmise from the good lady—Robin, who had been unnaturally silent for all of eight minutes shucked off his coat and headed for the studio couch in one continuous movement. He rolled off his feet and onto the couch with his head buried in the cushions.

"Robin—are you all right?"

"Mm-m-m."

She looked about her.

Robin's two-and-kitchenette was a fantastic place. She had never dreamed that the laws of gravity would permit such a piling-up of miscellany. There were two guitars on an easy-chair, one cracked across the head. A clarinet case with little holes punched in it lay on the floor by the wall. Curious, she bent and lifted the lid. It was lined with newspaper, and in it were two desiccated bananas and a live tarantula. She squeaked and dropped the cover.

Leaning against the far wall was a six-foot square canvas, unfinished, of a dream-scape of rolling hills and pale feathery trees. She looked away, blinked, and looked back. It could have been a mistake. She sincerely hoped that it was; but it seemed to her that the masses of

those hills, and the foliage, made a pretty clear picture of a . . . a—

"No," she whispered, "I haven't got that kind of a mind!"

There was a beautifully finished clay figurine standing proudly amongst a litter of plasticine, modeling tools, a guitar tuner and a flat glass of beer. It was a nude, in an exquisitely taut pose; a girl with her head flung back and a rapt expression on her face, and she was marsupial. On the bookcase was a four-foot model of a kayak made of whalebone and sealskin. Books overflowed the shelves and every table and chair in the place. There were none in the sink; it was too full of dishes, being sung to by a light cloud of fruit flies. It was more than she could stand. She slipped out of her coat, moved a fishbowl with some baby turtles in it, and an 8 mm projector, off the drainboard and went to work. After she had done all the dishes and reorganized the china closet, where ivy was growing, she rummaged a bit and found a spray gun, with which she attacked the fruit flies. It seemed to be a fairly efficient insecticide, although it smelled like banana oil and coagulated all over the sink. It wasn't until the next day that she identified the distinctive odor of it. It was pastel fixatif.

She tiptoed over to the arch and looked in at Robin. He had hardly moved. She knew he was probably good for twelve hours sleep.

She bent over him and gently pushed some of his rough hair away from his eyes. She had never seen eyes, before, which had such smooth lids.

Robin smiled while he slept. She wished she knew why.

Carefully she removed his shoes. She had to step very close to the couch to do it, and something crunched under her foot. It was a radio tube. She shook her head and sighed, and got a piece of cardboard—there was no dustpan—and a broom and swept up the pieces. Among them she found a stuffed canary and a fifty-dollar bill, both quite covered with "flug," or dust whiskers. She wondered how many times Robin had sat on that couch, over that bill, eating beans out of the can and thinking about some glorious fantasy of his own.

She sighed again and put on her coat. As she reached the door she paused, debating whether, if she left a note anywhere in this monumental clutter, he would find it. She wanted him to call her as soon as he awoke, so she could have an idea as to his prognosis. She knew well that in his condition, with his particular treatment, that the imbalances should be all adjusted within twelve hours. But still—

Then why not wake him and remind him to call?

She suddenly realized that she was afraid to—that she was glad he was asleep and . . . and harmless. She felt that she could name what it was she was afraid of if she tried. So she didn't try.

"Blast!" she said half aloud. She hated to be hesitant, ever, about anything. She hated to be puzzled, or afraid.

She would leave word with the landlady to wake him early in the morning, she decided abruptly.

She felt like a crawling coward.

She turned to the door, and Robin said brightly, "Good-by, Peg darlin'. Thanks for everything. You've been swell. I'll call you when I wake up."

"You young demon!" she ejaculated. "How long have you been awake?"

"I haven't been asleep," he said, coming to the archway. He chuckled. "I'm sorry to say you are right about the canvas. I forgot about the disgusting thing's being so conspicuous."

"Oh, that's all . . . why did you pretend to be asleep?"

"I felt something coming and didn't want it to."

"I . . . don't know what you mean; but why didn't you let it come?"

He looked at her somberly. Either it was something new, or she had never noticed the tinge of green in his eyes. "Because you wouldn't have fought me."

"I don't know what you're talking about."

The lower half of his face grinned. "You like most of the things I do," he said. "I like you to humor me in those things. Those things are"—he put his fingertips to his chest, then flung them outward—"like this—fun, from here out. I don't want to be humored from here *in*."

Over his shoulder she saw the big canvas. From this distance it was even more specific. She shuddered.

"Good-by, Peg."

It was a studied dismissal. She nodded, and went out, closing the door softly behind her. Then she ran.

Dr. Margaretta Wenzell was highly intelligent, and she was just as sensitive. Twice she appeared at Mel Warfield's laboratory at the hour appointed for Robin's succeeding treatments. Once Robin did not speak to her. The second time she went, Robin did not show up. On inquiry, she learned from the information desk at the medical center that Robin had been there, had asked if she were in Dr. Warfield's office, and having been told that she was, had turned around and walked out. After that she did not go again. She called up Warfield and asked him to forward Robin's case history and each progress report. Mel complied without asking questions; and if Dr. Wenzell spent more time poring over them than their importance justified, it was the only sign she gave that it mattered to her.

It mattered—very much. Never had Peg, in consultation or out, turned a patient over to another doctor before. And yet, she was conscious of a certain relief. Somehow, she was deeply certain that Robin had not ceased to like her. Consciously, she refused to give any importance to his liking for her, but in spite of that she derived a kind of comfort from an arduously-reached conclusion that Robin had reasons of his own for avoiding her,

and that they would come out in good time.

She was astonished at the progress reports. She could deduce the probable changes in Robin from the esoteric language of the reaction-listings. Here a sharp drop in the 17-kesteroids; there a note of an extraordinary effect of the whole metabolism, making it temporarily immune to the depressing effect of the adrenal cortices in colossal overdoses. An entry in the third week of the course caused Peg two sleepless nights of research; the pituitrin production was fluctuating wildly, with no apparent balancing reaction from any other gland—and no appreciable effect on the patient. A supplementary report arrived then, by special messenger, which eased her mind considerably. It showed a slight miscalculation in a bio-chemical analysis of Robin's blood which almost accounted for the incredible activity of the pituitaries. It continued to worry her, although she knew that she could hardly pretend to criticize Mel Warfield's vast experience in the practice of hormone therapy.

But somehow, somewhere deep inside, she did question something else in Mel. Impersonality had to go very closely with the unpredictable psycho-somatic and physiological changes that occurred during gland treatments; and in Robin's case, Peg doubted vaguely that Mel was able to be as detached as might be wished. She tried not to think about it, and was bothered by the effort of trying. And every time she felt able to laugh it off, she would remember Mel's odd statement in the laboratory that day—but then, he had taken such a quick and warm liking to the boy. Could he possibly resent him on her behalf? Again she felt that resurgence of fury at Mel—and at herself; and again she wished that she could be left alone; she wanted to laugh at herself in the rôle of *femme fatale,* but laughter was out of order.

The progress reports were by no means the only source of information about Robin, however. In the tenth day of his treatment, she noticed an item in the "Man About Town" column in the *Daily Blaze:*

> Patrons of the Goose's Neck were treated to a startling sight this a.m. when Vincent (The Duke) Voisier came tearing into the place, literally bowling over a table-full of customers—and their table—in the process of hauling Vic Hill, song writer extraordinary, out to the curb. The center of attention out there seemed to be a tousle-headed character by the name of Robin English, who told this snooper mildly that Mr. Voisier was going to produce his show. At that moment The Duke and Hill came sailing out of the bistro, scooped up this Robin English and hurled him into a taxicab, leaving your reporter in a cloud of carbon monoxide and wild surmise. Now followers of this column know that Brother Voisier is usually as excitable as the occupant of Slab 3 at the City Morgue. My guess is missed if show business isn't about to be shown some business. Voisier is a rich man because of his odd habit of taking no wild chances . . .

And then there was a letter from a book publisher tactfully asking for a character reference prior to giving one Robin English an advance on an anthology of poems. She answered immediately, giving

Robin an A-1 rating, and only after sending it off did she realize that a few short weeks ago she would not have considered such a thing. Robin's reliability was a strange and wonderful structure, and his record likewise.

At long last, then, came his phone call.

"Peg?"

"Wh . . . oh, Robin! Robin, how are you?"

"Sharp as a marshmallow, and disgustingly productive. Will you come over?"

"Come over?" she asked stupidly. "Where?"

"Robin's Roost," he chuckled. "My McGee hall closet and bath. Home."

"But Robin, I . . . you—"

"Safe as a tomb," he said solemnly.

"Don't intimate anything otherwise," she said as sharply as she could; but something within her rose delightedly at the overtones of amusement in his voice.

"I'm a big grown-up man now," he said. "Restrained, mature, reliable and thoroughly unappetizing. Come over and I won't be anything but repulsive. Impersonal. Detached. No . . . say semi-detached. Like a brownstone front. A serious mein. Well, if it's before dinner I'll have a chow mein."

"Stop!" she gasped. "Robin, you're mad! You're delirious!"

"Delirious and repressing, like a certain soft drink. Four o'clock suit you?"

It so happened that it did not. But "All right, Robin," she said helplessly, and hung up.

She discovered that she had cleared her afternoon so efficiently that she had time to go home and change. Well, of course she had to change. That princess neckline was —not daring, of course, but—too demure. That was it; demure. She did not want to be demure. She wanted to be businesslike.

So she changed to a navy sharkskin suit with a wide belt and a starched dicky at the throat, the severest thing in her wardrobe. It was incidental that it fitted like clasped hands, and took two inches off her second dimension and added them to her third. As incidental as Robin's double-take when he saw it; she could almost sense his shifting gears.

"Well!" said Robin as he stepped back from the door. "A mannequin, kin to the manna from heaven. Come *in*, Peg!"

"Do you write your scripts out, Robin? You *can't* generate those things on the spur of the moment!"

"I can for moments like this," he said gallantly, handing her inside.

It was her turn for a double-take. The little apartment was scrupulously clean and neat. Books were in bookcases; it had taken the addition of three more bookcases to accomplish that. A set of shelves had been built in one corner, very cleverly designed to break up the boxlike proportions of the room, and in it were neatly stacked manuscripts and, up above, musical instruments. There was more live-

stock than ever, but it was in cages and a terrarium—she wondered where the white rats had been on her last visit. Imprisoned in the bathtub, no doubt. There was a huge and gentle pastel of a laughing satyr on the wall. She wondered where the big oil was.

"I painted ol' Splay-foot over it," said Robin.

"You include telepathy among your many talents?" she asked without turning.

"I include a guilty conscience among my many neuroses," he countered. "Sit down."

"I hear you're getting a play produced," she said conversationally, as he deftly set out a beautiful tray of exotic morsels—avocado mashed with garlic juice on little toast squares; stuffed olives sliced paper-thin on zwieback and chive cheese; stems of fennel stuffed with blue-cheese; deviled eggs on rounds of pimento, and a strange and lovely dish of oriental cashews in blood-orange pulp.

"It isn't a play. It's a musical."

"Oh? Whose book?"

"Mine."

"Fine, Robin. I read that Vic Hill's doing the lyrics."

"Well, yes. Voisier seemed to think mine were— Well, to tell you the truth, he called in Hill for the name. Got to have a name people know. However, they are my lyrics."

"Robin. Are you letting him—"

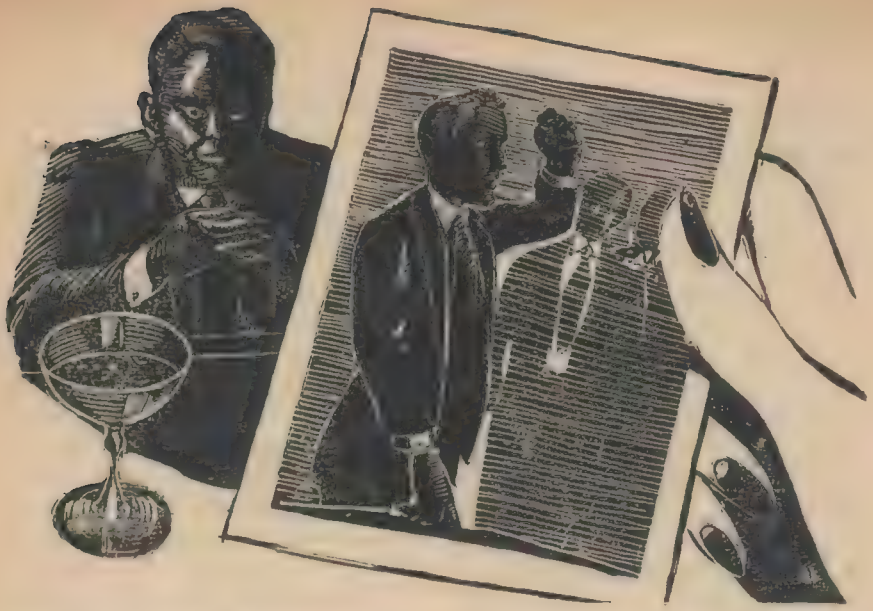
"Ah—shush, Peg! No one's doing anything to me!" He laughed. "Sorry. I can't help laughing at the way you, looking like a Vassar p.g., ruffle up like a mother hen. The truth is that I'm getting plenty out of this. There just don't seem to be enough names to go around on the billing. I wrote the silly little thing at one sitting, and filled in the music and staging just to round it off—sort of an overall synopsis. Next thing you know this Voisier is all over me like a tent, wanting me to direct it as well; and since there's a sequence in there—sort of a duet between voice and drums in boogie-beat—that no one seems to be able to do right, he wants me to act that part too." He spread his hands. "Voisier knows what he is doing. Only you can't have one man's name plastered all over the production. The public doesn't take to that kind of thing. Voisier's treating the whole deal the way he handles his trucking concern and his insurance business and his pharmaceutical house—like a business. Show business is still business."

"Oh—that's better. And what about this anthology of poems?"

"Oh, that. Stuff I had kicking around the house here." His eyes traveled over the neat shelves and bookcases. "Remarkable what a lot of salable material I had here, once I found it by cleaning up some."

"What else did you find?"

"Some gadgets. A centrifugal pump I designed using the business end of a meat grinder for the impeller. A way to take three-dimensional portraits with a head clamp and a swivel chair and a 35 mm camera. A formula for a quick-drying artist's oil pigment which can't contract the paint. A way to



drill holes through glass—holes a twenty-five thousandth of an inch or less in diameter—with some scraps of wire and a No. 6 dry cell. You know—odds and ends."

"You've marketed all these?"

"Yes, or patented or copyrighted them."

"Oh Robin, I'm *so* glad! Are you getting results?"

"Am I?" The old, lovely, wondering look came into his face. "Peg, people are crazy. They just give money away. I honestly don't have to think about money any more. That is, I never did; but now I tell people my account number and ask them to send their check to it for deposit, and they keep piling it in, and I can't cash enough checks to keep up with it. When are you going to ask me why I've been keeping away from you?"

The abruptness of the question took Peg's breath away. It was all she had been thinking about, and it was the reason she had accepted his invitation. She colored. "Frankly, I didn't know how to lead up to it."

"You didn't have to lead up to it," he said, smiling gravely. "You know that, Peg."

"I suppose I know it. Well—why?"

"You like the eatments?" He indicated the colorful dishes on the coffee table.

"Delicious, and simply lovely to look at. But—"

"It's like that. This isn't food for hungry people. Canapés like these are carefully designed to appeal to all five senses—if you delight in the crunch of good zwieback the way I do, and include hearing."

She stared at him. "I think I'm

being likened to a . . . a smorgasbord!"

He laughed. "The point I'm making is that a hungry man will go for this kind of food as happily as any other. The important thing to him is that it's food. If he happens to like the particular titillations offered by such food as this, he will probably look back on his gobbling with some regret, later, when his appetite for food is satisfied and his psychic—artistic, if you like—hungers can be felt." Robin grinned suddenly. "This is a wayward and wandering analogy, I know; but it does express why I kept away from you."

"It does?"

"Yes, of course. Look, Peg, I can see what's happening to me even if I am the patient. I wonder why so many doctors overlook that? You can play around with my metabolism and my psychology and ultimately affect such an abstract as my emotional maturity. But there's one thing you can't touch—and that is my own estimate of the things I have learned. My sense of values. You can change my approach to these things, but not the things themselves. One such thing is that I have a violent reaction against sordidness, no matter how well justified the sordidness may have been when I did the sordid thing, whatever it was. In the past, the justification has been the important thing. Now—and by 'now' I mean since I started these treatments—the reaction is more important. So I avoid sordidness because I don't want to live through the reaction afterward, and not so much because I dislike doing a sordid thing."

"That's a symptom of maturity," said Peg. "But what has it to do with me?"

"I was hungry," he said simply. "So hungry I couldn't see straight. And suddenly so full of horse sense that I wouldn't reach for the pretty canapés until I could fully appreciate them. And now—sit down, Peg!"

"I . . . have to go," she said in a throttled voice.

"Oh, you're wrong," he said, not moving. He spoke very quietly. "You don't have to go. You haven't been listening to me. You're acting defensive when I've laid no siege. I have just said that I'm incapable of doing anything in bad taste—that is, anything which will taste bad to me, now or later. And you are acting as if I had said the opposite. You are thinking with your emotions instead of your intellect."

Slowly, she sank back into her chair. "You take a great deal for granted," she said coldly.

"That, in effect, is what the bread and cheese and pimentos and olives told me when I told them about these trays," he said. "Oh, Peg, let's not quarrel. You know that all I've just said is true. I could candy-coat all my phrases, talk for twice as long, and say half as much; and if I did you'd resent it later; you know you would."

"I rather resent it now."

"Not really." He met her gaze, and held it until she began to smile.

"Robin, you're impossible!"

"Not impossible. Just highly unlikely."

He sprang to pour coffee for her—and how did he know that she preferred coffee to tea? he had both—and he said, "Now we can talk about the other thing that's bothering me. Mel."

"What about Mel?" she said sharply.

He smiled at her tone. "I gather that it's the other thing that's been bothering you?"

She almost swore at him.

"Sorry," he said with his quick grin, and was as quickly sober. "Warfield's very much in love with you, Peg."

"He—has said so."

"Not to me," said Robin. "I'm not intimating that he has poured out his soul to me. But he can't conceal it. What he mostly does is avoid talking about you. Under the circumstances, that begins to be repetitious and—significant." He shrugged. "Thing is, I have found myself a little worried from time to time. About myself."

"Since when did you start worrying about yourself?"

"Perhaps it's symptomatic. This induced maturity that I am beginning to be inflicted with has made me think carefully about a lot of things I used to pass off without a thought. No one can escape the basic urgencies of life—hunger, self-preservation, and so on. At my flightiest moments I was never completely unaware of hunger. The difference between a childish and a mature approach to such a basic seems to be that the child is preoccupied only with an immediate hunger. The adult directs most of his activities to overcoming tomorrow's hunger.

"Self-preservation is another basic that used to worry me not at all as long as danger was invisible. I'd dodge an approaching taxi, but not an approaching winter. Along comes a few gland-treatments, and I find myself feeling dangers, not emotionally, and now, but intellectually, and in the future."

"A healthy sign," nodded Peg.

"Perhaps so. Although that intellectual realization is a handy thing to have around to ward off personal catastrophies, it is also the raw material for an anxiety neurosis. I don't think Mel Warfield is trying to kill me, but I think he has reason enough to."

"What?" Peg said, horrified.

"Certainly. He loves you. You—" he broke off, and smiled engagingly. She felt her color rising, as she watched his bright eyes, the round bland oval of his almost chinless face.

"Don't say it, Robin," she breathed.

"—you won't marry him," Robin finished easily. "Whom you love needn't enter into the conversation." He laughed. "What amounts of wind we use to avoid the utterance of a couple of syllables! Anyway, let it suffice that Mel, for his own reasons, regards me as a rival, or at least as a stumbling block." His eyes narrowed shrewdly. "I gather that he has also concluded that your chief objection to me has been my

. . . ah . . . immaturity. No, Peg, don't bother to answer. So if I am right—and I think I am—he has been put in the unenviable position of working like fury to remove his chief rival's greatest drawback. His only drawback, if you'll forgive the phrase, ma'am," he added, with a twinkle and the tip of an imaginary hat. "No fun for him. And I don't think that Brother Mel is so constituted that he can get any pleasure out of the great sacrifice act."

"I think you're making a mountain out of—"

"Peg, Peg, certainly you know enough about psychology to realize that I am not accusing Mel of being a potential murderer, or even of consciously wanting to hurt me. But the compulsions of the subconscious are not civilized. Your barely expressed annoyance at the man who jostles you in a crowded bus is the civilized outlet to an impulse for raw murder. Your conditioned reflexes keep you from transfixing him with the nearest nail file; but what about the impulses of a man engaged in the subtle complexities of a thing like the glandular overhaul I'm getting? In the bus, your factor of safety with your reactions can run from no visible reaction through a lifted eyebrow to an acid comment, before you reach the point where you give him a light tap on the noggin and actually do damage. Whereas Mel's little old subconscious just has to cause his hand to slip while doing a subcutaneous, or to cause his eye to misread a figure on the milligram scale, for me to be disposed of in any several of many horrible ways. Peg! What's the matter?"

Her voice quivering, she said quietly, "That is the most disgusting, conceited, cowardly drivel I have ever had to listen to. Mel Warfield may have the misfortune to be human, but he is one of the finest humans I have ever met. As a scientist, there is no one in this country—probably in the world—more skilled than he. He is also a gentleman, in the good old-fashioned meaning of the word—I *will* say it, no matter how much adolescent sneering you choose to do—and if he is engaged on a case, the case comes first." She rose. "Robin, I have had to take a lot from you, because as a gland specialist I knew what an advanced condition I had to allow for. That is going to stop. You are going to find out that one of the prices you must pay for the privilege of becoming an adult is the control of the noises your mouth makes."

Robin looked a little startled. "It would be a little dishonest of me to think these things without expressing them."

She went on as if she hadn't heard. "The kind of control I mean has to go back further than the antrums. All of us have mean, cowardly thoughts from time to time. Apparently the maturity you're getting is normal enough that you're developing a man-sized inferiority complex along with it. You are beginning to recognize that Mel is a better man than you'll ever

be, and the only way you can rationalize that is to try to make him small enough to be taking advantage of you."

"Holy cow," breathed Robin. "Put down that knout, Peg! I'm not going to make a hobby of taking cracks at Mel Warfield behind his back. I'm just handing it to you straight, the way I see it, for just one reason—to explain why I am discontinuing the course of treatment."

She was halfway to the door as he spoke, and she brought up sharply as if she had been tied by a ten-foot rope. "Robin! You're not going to do anything of the kind!"

"I'm going to do exactly that," said Robin. "I'm not used to lying awake nights worrying about what someone else is likely to do. I'm doing all right. I've come as far in this thing as I intend to go. I'm producing more than I ever did in my life before, and I can live adequately on what I'm getting and will get for this music and these patents and plays and poems, to live for the rest of my life if I quit working tomorrow—and I'm not likely to quit working tomorrow."

"Robin! You're half hysterical! You don't know what you're talking about! In your present condition you can't depend on the biochemical balance of your glandular system. It can only be kept balanced artificially, until it gradually adjusts itself to operation without the thymus. In addition, the enormous but balanced overdoses of other gland extracts we have had to give you must be equalized as they recede to normalcy. You simply *can't* stop now!"

"I simply will stop now," he said, mimicking her tone. "I took the chance of starting with this treatment, and I'll take the chance of quitting. Don't worry; no matter what happens your beloved Mel's nose is clean, because of that release I signed. I'm not going to sue anybody."

She looked at him wonderingly. "You're really trying to be as offensive as you possibly can, aren't you? I wonder why?"

"It seems the only way for me to put over a point to you," he said irritably. "If you must know, there's another reason. The stuff I'm producing now is good, if I can believe what I read in the papers. It has occurred to me that whatever creativeness I have is largely compounded of the very immaturity you are trying to get rid of. Why should I cut off the supply of irrationality that produces a work of art like my musical comedy? Why should I continue a course of treatment that will ultimately lead me to producing nothing creative? I'm putting my art before my course, that's all."

"A good pun, Robin," said Peg stonily, "but a bad time for it. I think we'll let you stew in your own juice for a while. Watch your diet and your hours, and when you need professional help, get in touch with me and I'll see what I can do about getting Mel to take you on again."

"Nice of you. Why bother?"

"Partly sheer stubbornness; you make it so obvious you want nothing of the kind. Partly professional ethics, a thing which I wouldn't expect a child, however precocious, to understand fully."

He went slowly past her and opened the door. "Good-by, Dr. Wenzell."

"Good-by, Robin. And *good* luck."

Later, in her office at the hospital, Peg's phone rang.

"Yes?"

"Peg! I've just received a note, by messenger, from Robin English."

"Mel! What did he say?"

"He inclosed a check for just twice what I billed him for, and he says that he won't be back."

"Mel, is it safe?"

"Of course it's not safe! The pituitary reactions are absolutely unpredictable—you know that. I can't prognosticate anything at all without the seventy-two-hour check-ups. He might be all right; I really wouldn't know. He's strong and healthy and tremendously resilient. But to stop treatment now is taking unfair advantage of his metabolism. Can't you do anything about it?"

"Can't *I* do anything?"

"He'll listen to you, Peg. Try, won't you? I . . . well, in some ways I'm glad to have him off my neck, frankly. It's been . . . but anyway, I'll lose sleep over it, I know I will. Will you see if you can do anything with him?"

A long pause.

"Hello; Peg—are you still there?"

"Yes, Mel . . . let him go. It's what he wants."

"Peg! You . . . you mean you won't see him?"

"N-no, I—can't, Mel. I won't. Don't ask me to."

"I hardly know what to say. Peg, what's the matter?"

"*Nothing's* the matter. I won't see him, that's all, and if I did it wouldn't do any good. I don't care what hap— Oh, Mel, do watch him! Don't let anything . . . I mean, he's *got* to be all right. Read his stuff, Mel. Go see his plays. You'll be able to f-find out that way."

"And if I don't like the looks of what I find out, what am I supposed to do about it?"

"I don't know. I don't know. Call me up whenever you find out anything, Mel."

"I will, Peg. I'm—sorry. I didn't realize that you . . . I mean, I knew it, but I didn't know you felt so—"

"Good-by, Mel."

She hung up and sat and cried without hiding her face.

Robin's first novel was published five months later, while his musical, "Too Humorous To Mention," was eight weeks old and just at the brilliant beginning of its incredible run, while "The Cellophane Chalice," his little, forgotten book of verse, went into its sixth printing, and while three new songs from "Too Humorous" were changing places like the shells in the old army game, on the Hit

Parade in the one-two-three spots. The title of one of them, "Born Tomorrow," had been bought at an astonishing figure by Hollywood, and royalties were beginning to roll in for Robin's self-tapping back-out drill bits.

The novel was a strange and compelling volume called "Festoon." The ravings of the three critics who were fortunate enough to read it in manuscript made the title hit the top of the best-seller lists and stay there like a masthead. Robin English was made an honorary doctor of law by a college in Iowa, a Kentucky Colonel, a member of the Lambs Club and a technical advisor to the American Society of Basement Inventors. He dazedly declined a projected nomination to the State Senate which was backed by a colossal round robin; wrote a careful letter of thanks to the municipality of Enumclaw, Washington, for the baroque golden key to the city it sent him because of the fact that early in his life he had been born there; was photographed for the "Young Men of the Month" page of *Pic*, and bought himself a startlingly functional mansion in Westchester County. He wrote a skillful novella which was sold in Boston and banned in Paris, recorded a collection of *muezzin* calls, won a pie-eating contest at the Bucks County Fair, and made a radio address on the evolution of modern poetry which was called one of the most magnificent compositions in the history of the language. He bought a towboat and had a barge built in the most luxurious pleasure-yacht style and turned them over to the city hospitals for pleasure-cruises to Coney Island for invalid children. Then he disappeared.

He was a legend by then, and there was plenty of copy about him for the columnists and the press agents to run, so that in spite of his prominence, his absence was only gradually felt. But gradually the questions asked in the niteries and on the graveyard shifts at newspaper offices began to tell. Too often reporters came back empty handed when assigned to a new R. E. story—*any* new R. E. story. An item in the "Man About Town" column led to a few readers' letters, mostly from women, asking his whereabouts; and then there was a landslide of queries. It was worth a stick or two on the front pages, and then it suddenly disappeared from the papers when all the editors were told in a mimeographed letter that Mr. English's business would be handled by his law firm, which had on proud exhibition a complete power of attorney—and which would answer no queries. All business mail was photostated and returned, bearing Robin's rubber-stamped signature and the name of his lawyers. All fan mail was filed.

The categories of men who can disappear in New York are extreme. The very poor can manage it. The very rich cannot; but those richer than the very rich can manage it, with care. Robin did it.

And then the rumors started.

The rôle of "Billy-buffoon" which he had taken in his musical was a mask-and-wig part, and it was said that his understudy didn't work at every performance. English was reported to have been seen in Hollywood; in Russia; dead; and once even on Flatbush Avenue. Robin's extraordinary talents, in the gentle hands of idle talk, took on fantastic proportions. He was advisor to three cabinet members. He had invented a space drive and was at the moment circling Mars. He was painting a mural in the City Morgue. He was working on an epic novel. He had stumbled on a method for refining U-235 in the average well-equipped kitchen, and was going crazy in trying to conceal that he knew it. He was the author of every anonymous pamphlet cranked out to the public everywhere, from lurid tracts through political apassionatae to out and out pornography. And of course, murders and robberies were accredited to his capacious reputation. All of these things remained as engagingly fictional as his real activities had been; but since they had nothing like books and plays and inventions to perpetuate them, they faded from the press and from conversation.

But not from the thoughts of a few people. Drs. Wenzell and Warfield compiled and annotated Robin English's case history, with as close a psychological analysis as they could manage. Ostensibly, the work was purely one of professional interest; and yet if it led to a rational conclusion as to where he was and what he was doing, who could say that such a conclusion was not the reason for the work? In any case, the book was not published, but rested neatly in the active files of Mel Warfield's case records, and grew. And then there was one Voisier, himself a mysterious character about whom little was known except his aquiline features and unbuttoning eyes and his wealth, all of which were underestimated. Voisier thought about Robin a great deal; and because he was Voisier, he was able to gain scraps of information not available to most people. The conclusions he drew from two or three of these, one afternoon, led to the ringing of Peg's phone.

"Dr. Wenzell?"

"Yes?"

"Voisier speaking. Do you know Robin English?"

"Voisier, the producer? Oh, how do you do? Yes, I—have met Robin English."

"Do you happen to know where he is?"

"Does anyone?" she countered. "I understand that his lawyers—"

Voisier's soft chuckle slid over the wire and came out of the receiver like little audible smoke rings. "I have encountered his lawyers. Dr. Wenzell, I have to find out where he is."

"What has that to do with me?" Peg asked cautiously.

"There is some connection between you and Robin English," said Voisier smoothly. "Just a moment

—I'm not trying to find out what it is, and I don't care. I know only that it is a matter of professional interest to you and a Dr. Mellet Warfield; and I *don't* care what it is. I'll be frank with you; I must see him purely on a business matter. It will be to his advantage—all of his dealings with me have been, you know. After all, I discovered him."

"You discovered him the way the atom bomb was discovered by the mayor of Hiroshima," said Peg tartly.

Voisier laughed urbanely. "Very good." Peg was figuratively conscious of the swing of his boom as he changed his conversational tack. "Please, Dr. Wenzell—let's not get off on the wrong foot. I'm sorry if I seem to pry. Will you take lunch with me tomorrow?"

"I'm sorry. I'm busy tomorrow."

"Dinner this evening, then. That would be better."

"I am completely tied up, thank you," said Peg, over the rustle of silk in his voice. "And besides, I do not know where Robin English is or what he is doing. Good-b—"

"I know what he is doing," said Voisier quickly.

"You—"

Through a smile, Voisier's easy voice said, "Of course. I don't know where he is, that's all. I thought that with what I know and what you know we might be able to locate him. For his own good, of course. I gather that you would like very much to know where he is."

"What's he doing?"

"I *can't* tell you over the phone!" he said, in the voice in which one says "You *mustn't* play with Daddy's watch!"

"I wish you—" said Peg sharply, and then sighed. "When can I see you?"

"Thank you *very* much, doctor," he said abjectly, and was that a touch of relief in his voice? "Dinner tonight, then—unless you are busy, in which case . . . ah . . . cocktail time is practically here. I could meet you this afternoon, if you could—"

"Thank you," she said, and startlingly, she blushed at the eagerness she heard in her own voice. "How soon can you get here?"

"Very soon. I know where it is. I'll see you in a moment. And thanks again."

He hung up, and Peg sat looking at the bland cornerless bulk of her cradled telephone. Robin, Robin English. She formed his name with silent lips, and smiled a little. "Robin," she whispered, "I'm going to catch you by the ear and stand you in a corner for doing this to me." Robin was a child—such a child.

Her assistant came in. "A Mr. Voisier to see you doctor."

"Thank you, Helen. Ask him—*Voisier!* Good heavens, I didn't expect him so quickly! Yes, show him in. Show him right in!"

Voisier appeared at the door, rather as if he had been projected there. He looked over the office, more rapidly than he appeared to

be doing it, and then let his gaze slide to rest on her face. He smiled.

"Mr. Voisier?"

"I am very glad to meet you, doctor." He came forward, and she noticed that the Homburg he carried was not black, but a very dark brown. Like his eyes.

"You got here very quickly, Mr. Voisier."

"I was just downstairs when I called."

She frowned briefly, realizing that she had been told that he had come to the hospital perfectly confident that he could talk her into seeing him. She wondered why she didn't mind too much. "Sit down a moment," she said. "I'll be ready to leave in a second."

He thanked her, and surprised her by not taking the chair she indicated at the end of her desk and close to her, but one in the corner. He sat down, ignoring the magazines on the end table next to him, and rested a part of the weight of his eyes on her as she worked, stacking the reports on her desk and putting them away.

When her desk was clear she paused a moment, thinking, and then dipped into the file drawer and brought out her copy of Robin's case history. She did not open it —she knew every line in it—but sat running her fingers over the

binding, wondering whether to bring it with her.

"Bring it along," said Voisier, his eyes on the ceiling.

"I knew someone else who acted telepathic," said Peg with a little quirk of the lips. "All right."

The way he helped her on with her coat and handed her through the door made her feel like reaching for a lace train to drape over her arm as she walked. They did not speak as they went down in the elevator. She wanted to study his face, but he was studying hers, and strangely, she did not want to meet his eyes.

Parked in front of the hospital was a low-slung limousine, beautifully kept, not too new. A chauffeur with a young, impassive face opened the door and Peg got in, feeling the lack of a velvet carpet and a fanfare or two. Voisier followed, and the car slid silently into traffic. Voisier gave no orders to the chauffeur, which was another indication to Peg of how sure he had been that she would come out with him. She wondered if he had made reservations wherever they were going. She never knew, because they pulled up in front of Lelalo's, and both the doorman and the head waiter greeted Voisier effusively and she realized that they would at any time, reservation or no reservation. They were shown to a very comfortable corner table. Peg asked for an Alexander; Voisier did not order at all, but a silvery cocktail was brought and set down before him.

Finally she met his eyes. He seemed relaxed, but watchful, and his gaze was absolutely unswerving. She gritted her teeth and said lightly, "Have you read any good books lately?"

His eyes dropped to the case history lying on the table between them. "No," he said.

"Tell me what you know."

He drummed idly on the table with long, flexible fingers. "Robin is in the trucking business," he said.

"Oh?"

"Yes. And in insurance. Air freight. Distilling. Drugs. A few others."

"For goodness' sake! But that doesn't sound like Robin!"

"What doesn't s o u n d like Robin?"

"Robin is almost exclusively a creative person. Business—organizing, money-making itself—these have never had any interest for him."

"They have now," said Voisier in a slightly awed tone.

"If he did go into business," said Peg carefully, "it would be like that—diversification, and excellent results in everything he tried. That is, if he's still . . . I mean, if he hasn't changed. How do you know this?"

"I can't understand how he's doing it," Voisier said, ignoring her question. "He has bought out a bunch of independent truckers, for example. Standardized their equipment, rerouted and scheduled them, put in the latest equipment for servicing all the way, so that he

has practically delay-proof service. He pays his employees eight per cent more than . . . than other firms, and works them four less straight-time hours per week. Yet his rates are twelve per cent per hundred-weight under those of any of his competitors. Am I boring you?"

"You are not."

"He has hit the insurance business in an unusual way. He has a counseling service made up of insurance men so carefully chosen and so highly paid that his agency is a factor to be reckoned with by every company in the East. His specialty is in advising clients—the thousand-dollar policyholder to banking insurance—on ways and means of combining policies to get the maximum coverage from the smallest premium. His charge is nominal; it doesn't seem to be a money-making proposition, much, at all. But he is getting an increasing power to throw large blocks of insurance business any way he wants to. He does it to the benefit of the policyholder and well within the law. In other words, what he is machinating for is influence. And since nobody can possibly predict what he is going to do next, the agency is a Damocletian sword over us . . . uh . . . over the insurance companies."

"Mr. Voisier—wait. How do you know all this?"

"The most amazing thing of all is what he is doing in the drugs business. He has tapped a source of hard-to-get biochemicals that is something remarkable. Some sort of synthesis . . . nerve mind. I'm running along like a *Wall Street Journal* excerpt and I'm not going to start reciting things from the *Journal of the Chemical Institute.*"

"Have you seen him?"

"I have a picture of him. He spoke at a trucker's union meeting with his independent chain proposal recently. It's a good shot, and though he's changed a little since I last saw him, there's no mistaking him. He was using the name of Reuben Ritter—not that that's a matter of any importance, since elsewhere he is known as Schwartz, Mancinelli, Walker, Chandler, and O'Shaughnessy. Where he goes after the meetings and an occasional dinner he attends, no one knows. He only goes out on business and he always leaves a highly competent authority behind to handle the details."

"May I see the picture?"

"Certainly." Voisier took out a fine-tooled Moroccan wallet and leafed through it. He pulled out a four-by-five print and handed it to her.

"It *is* Robin," she said instantly, shakily; and then she pored over the picture, her eyes tearing down into it. A slight sound from Voisier made her look up; he was regarding her with a quizzical grin. She went back to the picture.

It was Robin, all right; and he stood before a flat table obviously in a loft which was converted to a meeting hall. He was half-leaning against the table, and his head and one arm were raised, and his face

was turned to the right of the camera.

Yes, it was Robin, all right; but Robin subtly changed. His features were—was it older? They were the features of a young man; but there was a set of purpose about the profile that was unfamiliar to her. Two slightly out-of-focus faces in the background, watching him with something approaching raptness, added to the completely authoritative, unselfconscious pose of the speaker. And Peg knew that from that picture alone, something within her would never again let her speak of Robin as "that child." It was a jarring realization, for "Robin" and "Childishness" were all but inseparable associations in her mind.

She became conscious of Voisier's long white hand hovering in front of her. She looked up and clutched the picture. "You want it back?"

"I'd . . . oh, I have the negative. Go ahead." The quizzical smile appeared again.

Peg slipped the picture into her pocketbook, closed it tightly, and only when she felt Voisier's amused eyes on her hands did she relax her grip on the clasp. She said, "How do you think I can help you locate him?"

Voisier put the tips of his fingers together and eyed her over them. "In that book of yours," he said, indicating the thick binder of prognosis carbons, "you probably have information which would help us to predict at least what sort of surroundings Robin English would find for himself. I know what businesses he's in, and pretty much how he's conducting them. Certainly we could draw some pretty shrewd conclusions." He paused, and looked thoughtfully at the second joints of his fingers, one after the other. "All I have to do is see him once. Just once," he said as if to himself. When I do, I can find out where he is living, what he is doing every hour, where he is liable to str . . . ah . . . jump next."

"You almost said 'where he will strike next,'" Peg said.

"Did I? I didn't know. That's ridiculous, of course."

"I suppose it is," she said slowly, watching his face. "Mr. Voisier, you have a remarkably easy way about you."

"I? Thank you."

"You're easy to talk with, and you talk easily. You divert the conversation to your chosen ways so *very* easily. You have still not told me why you want to locate Robin English."

"Everyone wants to know where Robin English is. Don't you read the papers?"

"I doubt, somehow, that you are motivated by intellectual curiosity. I don't think you want to produce another play of his, particularly, or sell a story to the press and scoop the town, or—obviously not this—give him pointers on his new business ventures. I hate to be blunt with anyone," she said with a sudden rush of warmth, "but I

must ask you—what are you after?"

He spread his hands. "I like the boy. Brilliant as he is, he is getting himself into a little hot water with certain of the interests with which he is competing. In the business world, as in the world of nations, there is room enough for everybody, providing everybody will co-operate. It is impossible to co-operate with a man who cannot be reached."

"It is impossible to retaliate, also."

Voisier held up a deploring hand. "Retaliate is too strong a term. Active as he is, it is inconceivable that he can keep himself hidden much longer. It is infinitely more desirable that I get to him before any of the others—I who have demonstrated so conclusively that I have his interests at heart. I like the boy."

"You like the boy." The picture of Robin in the union hall rose before her eyes. That was no boy. "Mr. Voisier, you are telling me that he is in danger, aren't you?"

He shrugged. "He *is* playing a dangerous game."

"Dangerous game? Danger from what?"

"I have not made up a roster, doctor."

She stared at him. "Mr. Voisier—just what business are *you* in?"

"I'm a producer. Surely you know that."

"Yes. I have just remembered that I heard you once mentioned in connection with the trucking business, and again, there was something to do with drugs—"

"You have a proclivity," said Voisier casually, "of connecting yourself, in one way or another, with remarkable people. I, like Robin English, am a man of some diversification."

She sat quietly for a moment, and thought. As Voisier had predicted, little pieces were beginning to fit here and there. Robin's progress had been so carefully charted, and prognosis made in such detail, that the information Voisier had given her was highly indicative. If she could talk it over with Mel—

"I can't piece all this together on the spot," she said.

"Why don't you get in touch with your associate, Dr. Warfield?"

"You *must* be psychic," she said wryly. "Let me phone him."

Without seeming to move quickly, Voisier was on his feet and assisting her out of the chair before she knew she was moving. "By all means," he said. "And if you can impress the urgency of the matter on him, it will be to Robin's benefit."

"I'll see," she said.

She went to the phone booth and called, and Mel was out, and when she returned to the table Voisier was gone. So was his limousine. So was Robin's case history.

"Mel, I don't know how I could have been such a fantastic idiot," she said brokenly.

She was in his office, hunched up in a big wing chair, and for

the first time in years looking small and childish and frightened.

"Don't blame yourself, Peg," said Warfield gently. "No one would expect that kind of prank from a man like that."

"It w-was awful," she almost whispered. "He made such a *fool* of me! I called the waiter immediately, of course, and he acted surprised to see me at all. He absolutely denied having seen such a thing as that case book at all. So did the head waiter. So did the doorman. They simply looked at me as if I were crazy, exchanging wondering glances at each other in between times. Mel . . . Mel, I don't *like* that man, that Voisier!"

"I wouldn't wonder."

"No—aside from that slick little piece of larceny. There's something evil about him."

"That's an understatement, if ever I heard one," Mel said. "I don't know much about that man—no one does—but the things I know aren't too good. I wonder if you knew that Chickering Chemical was his?"

"That drug firm that was peddling hashish as a tonic?"

"Not a tonic. A facial—mud pack, I think it was. It didn't harm the skin. Didn't do it any good, either. It was sold in small and adulterated quantities at a fantastic price, but it was hashish all right."

"But all the officers of that company are in jail?"

"All they could get anything on."

"How do you know this?"

"One of their lab assistants went to pharmaceutical school with me. Silly fool, he was, but a very likable character. He could be bought, and he was. He was paid well, and he didn't care. I did what I could to help him when the whole mess happened, but he was in too deep. He had no cause to lie to me, and he told me that Voisier was the man behind the whole rotten deal."

"Why didn't he give some evidence against Voisier?"

"No evidence. Not a scrap. Voisier's much too clever to leave loose ends around. Witness the trick he pulled on you. And besides—my imbecile of a friend rather admires him."

"Admires him—and Voisier got him into the penitentiary?"

"He blames only himself. And it seems that Voisier has a certain likable something about him—"

Peg thought of that saturnine face, and the compelling eyes of the man. She remembered his tactile glance, and the incredible flexibility of his voice. "Oh." She shook herself. "I can't afford the luxury of sitting here and saying how awful it all is," she said firmly, putting away her handkerchief. "What are we going to do?"

"Why do anything? Robin English is no longer our responsibility, if it's Robin you're worried about. As far as the book is concerned, I have the original, so that's a small loss."

"When does your responsibility to a person end?" she demanded hotly.

"That depends," he said, looking at the ceiling, "on what the person in question means to you. If it's a patient, and that patient, of sound mind, decides to go to another doctor or to stop treatment altogether, there is no law or ethic which demands that I try to hold him. If, on the other hand, the person is a . . . well, of personal interest, it's a different matter."

"And you feel that Robin can look out for himself?"

"He's demonstrated that pretty well so far. He must include self-preservation and the ability to act on it among his other talents."

"Mel—this isn't like you!"

"Isn't it, though!"

"Mel!" she cried, shocked. "If it weren't for us he wouldn't be in this trouble! He's hooked up with Voisier in some way, and—"

Mel put his hands on her shoulders and pushed her back in her chair. He looked at her somberly and then sighed. "Peg," he said finally, "I've got to say this. I deeply regret the day I ever set eyes on Robin English. You haven't been yourself since the day you met him."

She thought of the extraordinary statement Robin had made at tea that day, about Mel Warfield's desire to kill him. She looked up at Warfield with horror in her face.

"Listen to me," he said. "You're all tangled up in your emotions, and you can't think straight. You think Robin's mixed up with Voisier in some business way. Isn't it obvious what Robin is doing? You know that Voisier is mixed up in a dozen different businesses, two-thirds of which are shady in some way or another. You were told by Voisier himself that Robin is engaged in some of these same fields. I think you'll find that Robin is engaged in all of them. I think that if you are fool enough to mix yourself into anything this big and this dirty, you'll discover that Robin is out to undercut Voisier in everything the man is doing."

"Why? Why on earth should he do that?"

"I wouldn't know. Probably because he recognizes Voisier as his own brand of genius, with many years' start on him. Without doubt he feels crushed by Voisier—feels that the world isn't big enough for both of them. The 'why' of it isn't important. The fact remains that if he is not doing such a fantastic thing, he isn't in any danger and you needn't worry about him. If he is, then he must be outdoing Voisier on the dirtiest of his rackets."

"No, Mel—no! Robin wouldn't do that!"

"Someone is. How many new addiction cases has your hospital admitted in the past three months?"

"Well, there is a decided upswing, but what has that—"

"Robin *could* be responsible. It would have to be a one-source deal—someone previously unknown, without a record that can be checked, with a tremendous organizing ability and personal compulsion, and a lot of scientific skill.

Most of the drugs found on these poor devils are synthetic."

"But Robin never did an evil thing in his life!"

"He has done many things recently he never did in his life. I tell you, Peg, the responsibility I feel in this matter is a far greater one than anything that could happen to Robin English. If I'm right in all this, I have been instrumental in loosing something rather terrible in the world. And if I'm right and he's tackling Voisier by playing the man's own game, the odds are pretty strong that Voisier's too big for him. In which case—good riddance." He lowered his voice. "I'm sorry, Peg. Truly I am. I've been going round and round in smaller and smaller circles over this thing, and I've had enough."

Peg was feeling absolutely bewildered. "But I have only just told you about Voisier and this—"

"I've known about it for weeks, Peg. Let the thing take its course."

She rose, trembling. "You're wrong, Mel," she whispered. "You've *got* to be wrong."

"I'm afraid not," he said sadly. "I sincerely wish I were."

"I've got to see him."

"No, Peg! He might . . . he . . . can't you see that he's turned into a man who takes what he wants?"

"Does that make a difference?" Peg asked in a strange voice. "I can't let this happen to him. I'm going to find out where he is and see him. I'm responsible for this whole horrible thing and so are you. But through your stupid mulish jealousy you've argued yourself into blaming him!"

Warfield went white. "Responsible? He had the seeds of this in him all along. He simply never had the courage to do an honestly evil thing until we so generously matured him. Maturity is a strange thing, Peg. Like other riches, it is dangerous in unskilled hands. It isn't something that can be achieved all in a lump. We gave him a kind of maturity which gathered all the loose threads of his personality into something monolinear—something productive. But we didn't give him the power to use the years of experience he had had before we got to him. He's a bulldozer with a skilled idiot at the controls. But he is no longer a glandular case. If you want me to change my attitude at all, prove to me that he is still suffering from imbalance of any kind. That's in my field. That I can handle."

"I'll have to see him."

"Do you know where he is?"

"Nobody does. But I'll find him."

"I know where he is. But I will certainly not tell you."

"*You* know?"

"He came to see me four months ago." Warfield wet his lips. "He—had a word or two to say about you. He was apparently suffering from some sort of a delusion. He explained carefully to me that he had no use for you, that there was no longer any reason for me to want to . . . to kill him, and . . . you don't seem surprised."

"He told me about that the last time I saw him," she said, shaken.

"You *knew* about that?"

"*Did* you try to kill him, Mel?"

"It was an accident, Peg. Really it was. And he compensated for it. Splendidly. I don't know how he found out about it—the man's incredibly sharp."

Peg felt turned to ice, and her voice was ice as she said, "It was the post-pituitrin excess, wasn't it?"

"Yes, but that couldn't have anything to do with this Voisier business. I tell you it was an accident. I didn't realize that I'd made a mistake in the solutions until after he'd left the office that particular day. It didn't affect his progress, except temporarily; and when he stopped his treatments, he was practically normal." He stopped and wet his lips again, and then suddenly ran to her. "Peg! Peg, what's the matter?" For she had suddenly turned white, and was rocking on her feet. He put an arm about her shoulders and led her back to her chair. She slumped down, shook herself, and looked up at him with a swift, scornful glance that was almost a physical force.

"How do you *dare* to call yourself a doctor?" she breathed. She opened her handbag with shaking fingers and took out the photograph Voisier had given her. She handed it to him without glancing at it. "Look at that and tell me he's not still glandular," she said.

He looked, and then stared. "It's Robin, all right," he said, and then, with a ghost of his old grin, "Getting to be quite a glamour boy in his old age, hm-m-m?"

"He is? Have you noticed why?"

"What am I supposed to look for?"

"Look at his jaw."

"Nice jaw."

"You don't remember Robin. You don't remember that round baby face:"

"I wasn't in love with the man," Warfield said nastily.

"He didn't have much jaw," she said, her voice quivering. "Can't you see what's happening? That used to be *Robin,* with the charming, chinless face!"

Warfield's breath sucked sharply. He walked over to the window and for a long moment stood with his back to her, staring out.

"What do you diagnose, doctor?" she said acidly.

"Ac—" he began, and couldn't make it. He swallowed and coughed. He cleared his throat. He said, "Acromegaly."

"Acromegaly," she echoed sweetly. "His pre-pituitary has gone wild, he's suffering from hypertrophy of the chin and probably of the hands, and you say he's not glandular." Suddenly she was across the room, had spun him about and was clutching his lapels. "What are you going to *do?* Are you going to let him go on doing whatever crazy thing a glandular imbalance is forcing him to, so that he'll be killed by Voisier? Or are you going to stand by while he gets around Voisier some way and then turns into a monster and dies?"

"I have to think," said Warfield. "Oh, Peg. Peg—"

"You can't think," she said wildly. "Why do you suppose Voisier stole that book? With what he knows, and with what that book contains, he'll track Robin down in a matter of hours! Do you really know where he is?"

"Yes," Warfield whispered. "A piece of his strange kind of braggadocio. He was defiant, and yet he seemed afraid of me. He promised to keep in touch with me whatever he did, so that if I ever wanted to . . . kill him I could come and face him with whatever it was. He swore to keep away from you. He has moved four times since he stopped taking the treatments, and each time he has called or written to give me the address. I don't know why." Warfield raised his eyes to hers. "I don't know anything about any of this," he said brokenly. "It's all mad. We're being played like chessmen, Peg, by a lunatic against a devil."

"Is he in town?"

Warfield nodded.

"Well?"

Warfield looked at her. She was a statue now, a dark-crowned bloodless figure. "I'll go with you."

"I'll see him alone."

"I'll go with you all the same, then, and wait."

"Very well. Only hurry."

Warfield slipped out of his laboratory smock and into a coat without another word. Outside the office he stopped and said, "Peg . . . please—" but she walked steadily down to the elevators, and he shrugged and followed her.

They caught a cab almost immediately, and Warfield gave the driver a Riverside address. Peg sat staring blindly ahead of her. Mel slumped in a corner and looked at his wrists, dully.

Peg broke the silence only once—to ask in a deceptively conversational voice if anything had been learned that she didn't know about the treatment of acromegaly. Warfield shook his head vaguely. She made a sound, then, like a sob, but when Warfield looked at her she still sat, dry-eyed, staring at the driver's coat collar.

They pulled up in front of one of those stately old cell-blocks of apartment houses that perch on the slanted, winding approaches to the Drive. They got out, and a doorman, a bit over life-size, swung open both leaves of a huge plate glass and bronze door to let them into the building.

"Mr. Wenzell," said Warfield to a wax-faced desk clerk.

"What?" said Peg.

"He . . . it amuses him to use your name," said Warfield, as if he were speaking out of a mouthful of sal ammoniac.

"Mr. Wenzell is out," said the clerk. "Can I take a message?"

"You can take a message right to Mr. Wenzell, who is not out," said Warfield. "Tell him his two doctors are here and must see him."

"Tell him," said Peg clearly, 'that Margaretta Wenzell is here."

"Yes, Mrs. Wenzell," said the clerk with alacrity.

"Why must you make this painful as well as unpleasant?" gritted Warfield. Peg smiled with her teeth and said nothing.

The clerk returned from the phone looking as if he had learned how to pronounce a word he had only seen chalked on fences before. "Fourteen. Suite C. The elevators—"

"Yes," growled Warfield. He took Peg's elbow and walked her over to the elevators as if she were a window-dummy.

"You're hurting me."

"I'm sorry. I'm—a little upset. Do you have to go through with this weird business?"

She didn't answer. Instead she said, "Stay down here, Mel."

"I will not!"

She looked at him, and said a thousand words—hot-acid ones—in the sweep of her eyes across his face.

"Well," he said, "all right. All right. Tell you what. I'll give you fifteen minutes and then I'm coming up." He paused. "Why are you looking at me like that? What are you thinking about?"

"That corny line about the fifteen minutes. I was thinking about how much better Robin would deliver it."

"I think I hate you," said Warfield hoarsely, quietly.

Peg stepped into the elevator. "That was *much* better done," she said, and pushed the button which closed the doors.

On the fourteenth floor she walked to the door marked "C" and touched the bell. The door swung open instantly.

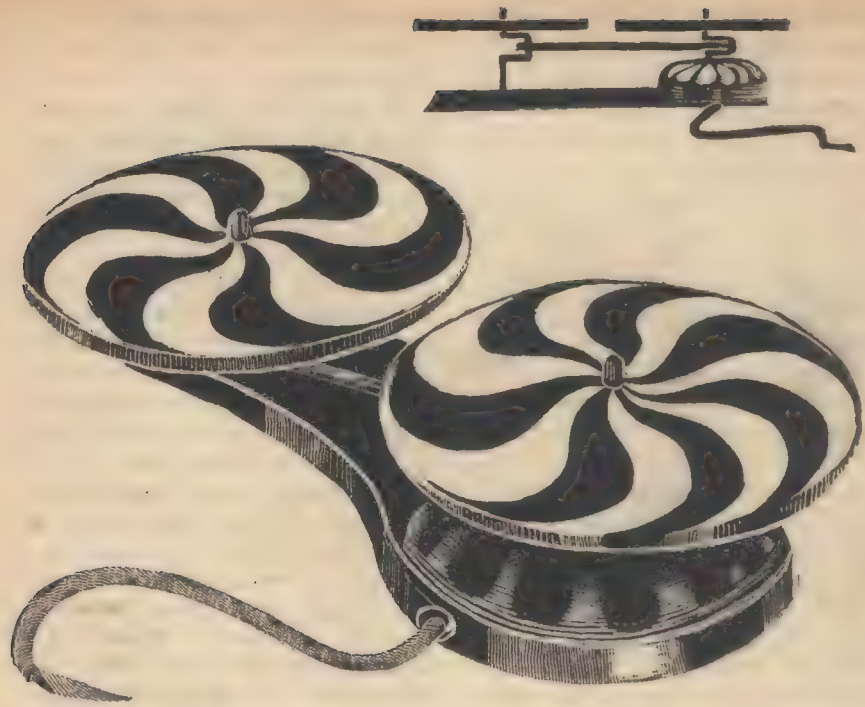
"Come in!" grated a voice. There was no one standing in the doorway at all. She hesitated. Then she saw that someone was peering through the crack at the hinge side of the door.

"Come in, Peg!" said the voice. It was used gently now, though it was still gravelly. She stepped through and into the room. The door closed behind her. Robin was there, with a gun. He put it away and held out both hands to her. "Peg! It's *so* good to see you!"

"Hello, Robin," she whispered. Just what gesture she was about to make she would never know, for she became suddenly conscious of someone else in the room. She wheeled. There was a girl on the chesterfield, who rose as Peg faced her. The girl didn't look, somehow, like a person. She looked like too many bright colors.

"Janice," said Robin. It wasn't an introduction. Robin just said the one word and moved his head slightly. The girl came slowly across the room toward him, passed him, went to the hall closet and took out a coat and a hat and a handbag with a long strap. She draped the coat over her arm and opened the door; and then she paused and shot Peg a look of such utter hatred that Peg gasped. The door closed and she was alone with Robin English.

"Is *that* the best you can do," she said, without trying to keep the loathing out of her voice.



"The very best," said Robin equably. "Janice is utterly stupid. She has no conversation, particularly when I want none. What she has to recommend her, you can see. She is a great convenience."

A silly, colorful little thought crept into Peg's mind. She looked around the room.

"You're looking for a smorgasbord tray," chuckled Robin, sinking into an easy-chair and regarding her with amusement. "Why won't you look at me?"

Finally, she did.

He was taller, a very little. He was much handsomer. She saw that, and it was as if something festering within her had been lanced. There was pain—but oh! the blessed relief of pressure! His face was—*Oh yes,* said Dr. Wenzell to herself, *pre-pituitary. Acromegaly.* She said, "Let me see your hands."

He raised his eyebrows, and put his hands in his pockets. He shook his head.

Peg turned on her heel and went to the hall closet. She dipped into the pockets of an overcoat, and then into a topcoat, until she found a pair of gloves. She came back into the room, examining them carefully. Robin got to his feet.

"As I thought," she said. She held up the left glove. The seam between the index and second fin-

gers was split. And they were new gloves. She threw them aside.

"So you know about that. You would, of course."

"Robin, I don't think this would have happened if you had continued your treatments."

He slowly took out his hands and stared at them. They were lumpy, and the fingers were too long, and a little crooked. "A phenomenal hypertrophy of the bony processes, according to the books," he said. "A development that generally takes years."

"There's nothing normal about this case. There never was," said Peg, her voice thick with pity. "Why did you let it go like this?"

"I got interested in what I was doing." Suddenly he got to his feet and began to stride restlessly about the room. She tried not to look at him, at his altered face, with the heavy, coarse jaw. She strained to catch the remnants of his mellow voice through the harshness she heard now.

He said, "It was all right during those months when I wrote 'Too Humorous To Mention' and 'Festoon' and invented the back out drills and all that. But everything got too easy. I could do anything I wanted to do. All of the things I had ever dreamed about doing I could do—and so easily! It was awful. I tried harder things, and they came easy too. I couldn't seem to apply myself on anything that couldn't be seen or touched, though perhaps if I had been able to go into higher mathematics or something purely abstract like that, I wouldn't be—well, what I am now.

"I began to be afraid. The one thing I couldn't whip was Mel Warfield. I was afraid of him. He hated me. I don't think he knew it, but he hated me. I wanted you. There was a time when I could have—but I was afraid of him. He had too much power over me. Too much thumb-pressure on that hypodermic of his, or the addition of some little drop of something in a test tube, and he could do anything he wanted with me. I'd never been afraid for myself before. Maybe it was part of that maturity you were talking about."

"I imagine it was."

Robin sat down heavily, clasped his hands, stared at them, put them in his pockets again. "I was glad to take the risk, mind you. It wasn't that. Anything in my condition that was suddenly too much for his skill to cope with—any accident like that couldn't frighten me. It was knowing that he hated me, and somewhere underneath he wanted me out of the way—preferably dead. Anyway—I got out. I kept him informed as to where I was, because I was ready for him. I was ready to kill him first if he came after me. But no hypodermics. No solutions. So—I went on with my work, and then it all got old, right away. I could do anything I wanted to do. Peg—can you imagine how horrible that can be? Never to know you might fail? To have such a clear conception of what the public wants in a play or a poem or a machine that

you can make it and know from the start that it will be a success? I knew a man once, who had photography for a hobby. He got to be so good that he stopped printing his negatives. He'd *know* they were perfect. He pulled 'em out of the hypo and dried 'em and filed 'em. Often he sold them without looking at them. It killed his hobby. He took up electronics, which was more his speed. But I'm that way about everything."

"You got bored."

"Bored. Oh, Peg, if you only knew the things I tried! Finally I dropped out of sight. I got a kick out of the papers then. For a while. Know what I was doing when the whole world thought I was doing something fantastic? I was reading. I was holed up in the back room of my Westchester place with all the books I had ever wanted to read. That's all. They let me get out of myself—for a while. For a while." He stopped and wiped sweat off his lip. "But it happened again. It got so that a page or two would tell me an author's style, a paragraph or two told me his plot. Technical books the same; once I got the basics the whole thing was there. Or maybe I thought it was. Maybe I just lost interest. It was as if I were being pursued by a monster called Understanding. I understood everything I looked at or thought about. There was nothing I could see or say or do or read or think about where I couldn't predict the end result. I didn't want to give anything any more, either, the way I did with the Whirltoy. Do you know what I wanted? I wanted to fail. I didn't think I could. I don't think so now. If I purposely botched a thing up, that would be a success of a sort. So for a long time I did nothing."

He fell silent. Peg waited patiently. She had had dozens of questions to ask, and half of them were already answered.

"Then I began to think about Voisier. You know Voisier?"

She nodded. "Robin—wait a minute. You hate Voisier. I think you're trying to ruin him. But you hated Mel Warfield. Why didn't you try to—"

"Warfield? By then, he wasn't big enough. Voisier was the only man I ever met whom I thought could beat me." He sighed. "Now I think he won't do it." And suddenly, Robin smiled. The smile sat badly on that heavy face. "Peg, there's an alternative to unquenchable, inevitable success. That is to play a game in such a way that you never can know how it ends. That's what I'm doing."

"Voisier's trying to find you."

"Is he now? How do you know?" For the first time Robin's face and voice showed real animation. All the twisted ravings of the past few minutes had come out of him like toothpaste out of a tube.

Peg told him about Voisier's calling the hospital, and what had happened at Lelalo's, where he had stolen the case history.

"Good," said Robin. "Oh, fine. This means that things are shaping up better than I thought. Faster. Uh—excuse me a moment."

He went to the desk in the corner, sat down, and began to write rapidly.

"This maturity thing," he said, phrasing between the lines he was writing, "I think you and Warfield overlooked something. I'm the patient. Do doctors listen to patients?"

"They do."

"You realize, don't you, that humans die before they're fully mature?"

"You mean in the sense that their bones do not completely ossify?"

"That's it. And there's a psychological factor, too." He paused, thought a while, wrote for a moment, and then went on. "Puppies and kittens and lion cubs —they're terribly foolish, in a pretty kind of way. They have their mock battles and they chase their balls of paper and get wound up in milady's yarn, don't they?"

"They do, but—"

"Humans, with few exceptions, *always* are puppyish, to a degree. There is even a parallel in the proportions of head to body, even allowing for the larger brain pan of *homo sapiens*. An adult human being has proportions comparable to a half-grown colt or dog in that respect. Now—did you ever hear of a full-grown gorilla acting kittenish? Or a bison bull, or a lion? Life for them is a serious business —one of sex, hunger, self-preservation and a peculiar, 'don't tread on me' kind of possessiveness.

"Peg—let's face it. That's what's happened to me. I can't go back. I don't see how I can go on this way. I'm mature now. But I'm mature like an animal. However, I can't stop being human. A human being has to have one thing—he has to be happy, or he has to think he knows what happiness is. Happiness for me is unthinkable. There is nothing for me to work toward. All of my achievements are here"—he tapped his head—"as good as done when I think of them, because I know I can do them. No goal, no aspiration—the only thing left is that little game of mine, the one where, according to the rules, I can't ever really know the result."

"Voisier?"

"Voisier." He picked up the phone, dialed rapidly. He listened. "Come on back," he said. He hung up. "That was Janice. She'll be here in fifteen minutes. You'd better go, Peg."

The door buzzer began to shrill. Robin leaped across the room; the gun was in his hand again. He opened the door and stood behind it, peering out at the hinge side as he had before. Mel walked in.

"Peg—are you all right?"

"A little bewildered."

"Of course she's all right," said Robin in a tone that insulted both of them. Mel stared at him. Robin went over to the desk, picked up the sheets he had written and, folding them, handed them to Peg. "Promise me you won't read these until you get back to Mel's office."

"I promise."

Mel spoke up, suddenly—and with great effort. "English—You know what that condition is?" He indicated Robin's face.

"He does, Mel," said Peg. "Don't—"

Warfield pushed her hand off his arm impatiently. "Robin, I'm willing to do what I can to arrest it, and there's a chance . . . not much, you understand—"

Robin interrupted him with a sudden, thunderous guffaw—quite the most horrible sound Peg had ever heard. "Why sure, Mel, sure. I'll be a bit busy this afternoon, but say tomorrow, if we can get together?"

"Robin!" said Peg joyfully. "You *will?*"

"Why not?" He chuckled. "Don't make an apointment today. Call me tomorrow." He took the note back from Peg, and scribbled on it. "Here's the number. Now go on. Beat it, you two. Maybe I ought to say something like 'Bless you, my children' but I— Oh, beat it."

Peg found herself in the hall and then at the door. "But Robin—" she said weakly; but by then the door was closed and Mel was guiding her into the elevator.

At Mel's office a few minutes later, she unfolded Robin's note with trembling fingers. It read:

Peg dear,

Here is where a mature human being gets kittenish, if he has to kill himself in the attempt.

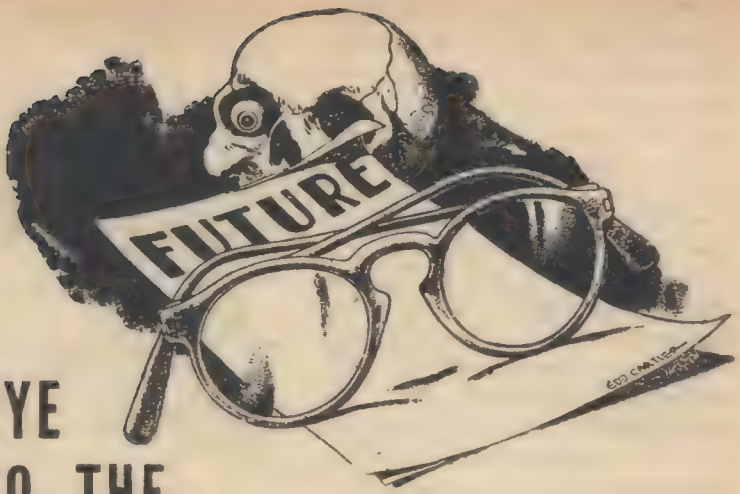
What I have been doing to Voisier is to drive him crazy. He's a bad apple, Peg. Very few people realize just how bad. I knew today would be the payoff when you told me how he had stolen the book and all that. He played you for bait. I told you he was almost as clever as I am. He knew that if he could worry you enough, you'd find me some way. My guess is that he simply had you followed until you found me. Then he'd wait until you had gone—he's waiting as I write this. When he's sure there are no witnesses, he'll come and finish his business with me.

This is my game, Peg. The only one I can think of where I'll never know who won. If you call the police about now, chances are they'll find him here. Make it an anonymous tip, and *don't* use this note as evidence of any kind. Voisier is going to get his; Janice is here and besides, the place is equipped with a very fine wire recorder. I'll handle all the dialogue. I'm sorry about all those dope fiends I had to supply to undercut his rotten racket. Take care of 'em.

And down in the corner, where he had ostensibly written his phone number, were these words: "Sorry I can't keep that appointment. The condition is already arrested."

Peg phoned the police. The police found Robin English dead. Robin English left everything he had to Peg and Warfield equally. And in due course Voisier was electrocuted for the murder. The recording found in his apartment, coupled with the testimony of one Janice Brooks, was quite sufficient. Voisier's defense, that Robin was torturing him, held no water; for where is a law that specifies mental torture as grounds for justifiable homicide?

THE END.



EYE TO THE FUTURE

BY REE DRAGONETTE

***Being** able to see tomorrow might be interesting—but, of course, both dangerous and, perhaps, futile. But stealing a glimpse of the future is far more dangerous!*

Illustrated by Cartier

Interoffice communique from Time Research Central to Chronoscope Department, June 17, 2372.

SUBJECT: Cessation of transmission from Chronoscope E-4 (location, New York State, Twentieth Century) as of 1:03 p.m. local time, June 15, 1946.

1. Subject report acknowledged

2. The Director instructs that a transcription be made of the recording of the twenty-four hours preceding cessation of operation of chronoscope in question.

Tim Jackson angrily closed the door of the walnut paneled office. He didn't like the boss at any time, and this morning he hated him heartily. That smug, smooth-shaven face above the cigars and chrome decanter incited a sleeping fury that had been gnawing at Tim. He strode down the corridor, muttering. So the boss was being pressured by the distributors, was he? This was an emergency order. Optical blanks were needed out of all proportion to present supplies, and much indignation was issuing from the New

York office. It was up to Tim to expedite things, was it? Fine thing! While the boss sat in his comfortable office, complaining and passing the buck. It was he, Tim, who had the real responsibility. Well, he just didn't care too much. He'd had enough, and the boss could do all the worrying from now on!

The haranguing he'd received from the boss was the final straw to Tim's misery that day. He had slept little the night before, with his wife nagging until his head split. She had not only refused his explanations for staying out, but also the money and the trinket he had won from Bill in the poker game. He brought the thing home especially for her, and the way she flung it back at him was infuriating. Jane loved pretty things, and the glass statuette was lovely, with clear, modeled eyes gleaming in its wise, oval face. It was odd for Jane to have acted so perverse, and when she carried it so far as to force him to get his own breakfast—that was too much! He always burned something, the eggs or toast, and he was late getting started. In his haste, he spilled hot grease on his hand, and finally had to leave without finishing the food, charred and bitter as it tasted. Tim's thoughts whirled annoyingly, and fixed themselves with alternate emphasis on Jane, and the boss. His burned fingers smarted and tingled, and his anger mounted. By the time he reached the melting furnace he was quivering with fury. Notions of escape assailed him.

Ordinarily, Tim was a cheerful, efficient worker; in spite of personal feelings or the difficulties of his trade. In charge of the "fining" process, he had a certain creative affection for the swirling stuff that eventually was annealed, and cut into blanks to be ground into lenses. Right now, however, he took no pride in his job, felt no compunctions about wasting time, or failing everybody who, directly or indirectly, depended on him. He wanted to destroy the whole flowing mess in the pot, let chips of clay or something get into it; and somehow release his chained violence before he ran away.

Tim conquered the rash desire, and went sullenly about his work. As the day grew hotter, so did his temper, until machinery, melt, and even his thoughts, beat like body blows upon him. He breathed in fierce gasps, and wiped sweating hands on his trousers. His fingers felt a small object in his pocket. Taking it out, he examined it curiously. An idea snaked slowly through him. What a way to fix the boss! He would damage the melt, but he would do it so cleverly that it passed all inspections until the blanks were ground and ready for shipping. The figurine sparkled temptingly in his fingers. If Jane didn't want his amber offering, he would dispose of it, to his greater satisfaction. He studied it closely. It was a fine color, pale enough to affect the melt so slightly that it would go undetected until it was too late to blame him. Let the inspectors take the punishment. Eventually it would come back to the boss, but good!

Tim hesitated, smiled stiffly, and dropped the round body into the vat. Its luminous eyes held the light before it was sucked into fluid depths.

The wall clock said 1:03 p.m. Tim realized he was very hungry.

Interoffice communique from Time Research to Chronoscope Department, June 18, 2372.

SUBJECT: Cessation of transmission from Chronoscope E-4.

1. Report and brief of transcription acknowledged.

2. In regard to the Department's question as to procedure with E-4's receiver, the Director instructs that no steps be taken to make it inoperable at present. An effort will be made to transmit a substitute Chronoscope to the temporal area which has been scanned by E-4. The receiver will therefore be left in operation until further notice, and daily checks made on it to determine whether the substitute Chronoscope has reached E-4's location in space and time.

The telephone order called for two semi-finished cylinders: O.S.—A 3.25—O.D.—A 3.50; to be sent by special messenger immediately. The stock clerk who filled the order did so from the supply that had just been stacked. The blanks were well on their way when a memo was delivered from the testing laboratory, to the effect that the new Corbal semi-finished were defective due to "seeds" and must not be used.

"But I've just sent out a pair," moaned the clerk. "Inspection's a little slow down there, isn't it?"

"Sorry, that's the order," retorted the messenger. "You'll have to let one pair pass."

Everybody but Tim was in an uproar. His only trouble was that Jane had asked for the figurine and he didn't know where he could find another one.

Dr. Felden measured the pupillary distance once more, and made a slight change in the curve of the temples. Then, fitting the glasses with quick accuracy, she surveyed her stocky patient approvingly.

"There you are, Mr. Horton." She clicked off the table light. "I'm glad we refracted again. It's been a year, and there's enough change in this prescription to increase your comfort considerably."

"They seem fine, doctor. Convenient just now too, since we're piled up with statements and reports, and our staff is small. Bad enough having extra hours without those headaches I've been having."

"Well, you shouldn't have any trouble. However, I'll check again next week. Wear them as much as possible, and if they bother you at all, use your old ones, until you come in to see me."

He thanked her and went out into late sunshine. The glasses brightened everything.

He had some dinner, then returned to the office. Garey Barnes, his angular, bronze-haired junior accountant, was pounding speedily on the calculator and didn't look up as Jeff called hello. Jeff gave a moment's attention to this unsociableness before proceding with his work.

After several hours of steady concentration they stopped, put things in order, and left together. They went down in the elevator and said brief goodnights when they emerged on the main floor.

The following week Jeff kept his appointment with Dr. Felden. The glasses checked perfectly on the complex testing instruments, and the oculist assured him that they were as nearly correct as possible.

"Try to keep them on, now," she admonished as she showed him to the door.

It had been a cloudless, iridescent day, and Jeff, feeling a Saturday relief from the week's tedium, wanted a walk. Stepping to the sidewalk, he glanced about questioningly. In amazement he peered into gathering darkness. There had been no indication of storm, and it was far too early for sundown. Nevertheless, lights broke the shadowy bulks of buildings, and the air looked wind-stirred. Jeff shook his head, senses taut. Nothing altered in the sound, or the feel of things, only in appearances. Jeff's prosaic, literal mind worked calmly, but his insides twisted in icy turbulence. No rain fell, and he felt none of the breeze he saw rippling the thin branches overhead. Traffic blared cacophonously, yet the street appeared vacant. Jeff found himself running, and slowed down to catch his breath. A procession of terrors pursued him. He had never known psychic disturbances; now he feared insanity or some hideous delirium. He stood still, and looked up at the sky, right into a swarm of stars. Twitching with bewilderment, he walked over to a lighted doorway. Wrist raised awkwardly, he could not believe either his watch, his sight, or his brain. He struggled back to the oculist's, pushing helplessly at the door. A neon sign shone dully in the window, and he stared at it dazedly. He must be mad—it couldn't be the middle of night. Only a few minutes ago it had been noon, and life was normal. Now, some calamitous, fantastic thing had happened to the world.

In a narrow margin at the rims of his glasses, he was aware of daylight. Frantically, he pulled them off. The day wheeled back into place, the sun pouring from a flawless sky. Hysterically, Jeff tried Dr. Felden's door again. Even when he remembered that she had been about to close when he left there, he continued to push fumblingly, rattling the knob. The spectacles hung from his numbed hand; he watched them in searchful horror, and battered at the door. Unable to think rationally, he waited, then turned away, the glasses still dangling. He rolled his eyes in an agony of confusion. At last the day's radiant familiarity soaked in, and by the time he reached the subway, his black terror subsided like a spent nightmare. Regaining control, he put the glasses away, and sat quietly through the short train ride to his home.

Over the week end he tried to rest, but his mind circled, impotently, about his unnatural experience. Jeff had never suffered nerv-

ous disorders, or developed weird complexes. In spite of his present mental turmoil, his innate tranquility returned. Curiosity overcame fear; a curiosity colored with an adventurous spark. Up until this bizarre occurrence, his life had been dully uneventful. This new pattern was one of absorbing interest. Although it seemed futile to try to solve a problem he couldn't understand, it was becoming fascinating to investigate.

Excited and wakeful, he rose from bed. Switching on lights, he picked up the blue leather case which he had placed on the dresser. His hands reluctant, he adjusted the glasses gingerly on his face, and resolved to remain imperturbed, no matter what.

Going to the window, he looked out, expecting a dazzling panorama. There was wide grayness instead. Ragged strands of rain wound down from a swollen sky. With the sleeve of his robe, Jeff brushed the pane, and leaned on the sill, pondering. It had been a clear night, forecasting fair weather. He glanced at his watch, believing it this time. He moved from the window, and slumped in an armchair. A margin of electric light contrasted with the afternoon grayness before him. When he took off the spectacles, it was night again, and the room's incandescence was torturing. His eyes winced, then widened, to take in first the numerals on his watch, then the oblong of world bordered by the window.

When the first stains of dawn spread, Jeff went back to bed.

He was not a garrulous person, especially during business hours. Although he was in continual proximity with his assistant, they seldom talked. Most people liked Jeff, but Garey Barnes didn't evidence emotion of any kind, about anyone. Congenial, Jeff liked to exchange pleasantries now and then, but with Garey he had to be guarded and formal. Today, he didn't much wish to speak to anyone, and his assistant's presence disconcerted him more than usual. Once or twice he had glanced up to find Garey's green eyes fixed intensely on him, as if they could enter regions closed to intrusion. Jeff went back to his mathematical computations, frowning. His attention kept wandering to his fabulous glasses. When he managed to dismiss them, his thoughts turned to Garey. Both were tormenting mysteries.

Jeff's head throbbed. He had to wear his old glasses for ordinary purposes. If he put the new ones on, everyone in the office disappeared and he saw the emptiness of an evening scene, with wastebaskets piled up, and the drab figure of a cleaning woman. It just wouldn't do, except if he wanted to amuse himself in an idle interval. Therefore, he managed painfully with his old spectacles, since he didn't wish to consult an ophthalmologist for fear of learning that some obscure disease was causing the aberration. He did not want to become the subject of medical experimentation. To go back to Dr. Felden was equally unthinkable, since, in her very extensive tests she had found the glasses

optically correct. He could hardly explain that after the first week some process had taken place, and that not many minutes after his final examination, the world of his sight had changed unbelievably. Keratometers and refractors don't lie; at least he wasn't going to try to tell anyone they did.

Jeff's reverie was interrupted by Garey's handing him a sheaf of statements. For a while there was no time for further meditation. After lunch, and a few helpful cups of black coffee, he felt better. By the end of the day he had quite cheerfully decided to keep his queer secret, and make the best of it. Even Garey's laconic coldness in response to some light chatter, didn't disturb him.

Over a period of several weeks Jeff grew used to his gift of special sight, and took pleasure in it. He came to certain definite conclusions. Actually, there was nothing wrong with the glasses, except that when he looked through them, it was tomorrow—or very much later today!

He recorded all information, planning to compile the results and submit them to someone more competent than he to investigate such matters. In the meantime, however, he avoided disclosure. On one occasion when he had slipped them on at the office, the treasurer startled him by inquiring:

"Have you gone in for glamour in those dark glasses, Horton?"

Jeff made a hasty, noncommittal reply, puzzled until he realized that of course, since it was afternoon, the glasses would appear dark on his face. When he put them down, they winked and glimmered whitely against the polished mahogany.

If the genial treasurer had noticed something strange about the glasses, less friendly eyes might—Garey's, for instance.

One evening when he was certain that no one else would be there, Jeff took the glasses into the office. His observations were the sort he had come to regard as routine. Standing by the window, he noted the spiraling of chimney smoke toward quilted clouds, and the winging streak of a plane or two along the sky.

A humorous notion to watch the arrival of co-workers made him turn, and face the door. It opened, and Garey came through, to stand limned in morning light. Superciliously, his glance swung in the direction of Jeff's desk, and a surge of loathing and contempt darkened his face. The shadow of someone rising opposite him fell upon Garey, and stiffening, he walked into the room, his face once more an impenetrable seal.

Jeff felt his pulse racing in shock. He sat down. Before his lowered eyes, a glass tray of pencils and pens glinted prismatically. He changed to his old spectacles and tried to do some work. Distracted, he soon gave up and left.

He walked across the Battery, toward the river, and thought worriedly about Garey. He had never disliked him, but he often wondered what is was that separated him so distinctly from other people, and

made him appear so broodingly self-sufficient. Jeff knew little about him, except that, according to company records, he was in his late twenties, had one college degree, and was once a newspaper reporter. Rumor whispered that he had left his home and a brilliant career in journalism, because of some enmity toward his father, a wealthy publisher. Beyond this, a first-hand history was impossible, as Garey did not talk about himself, when he talked at all. Whenever he tried to make friendly overtures toward his sullen, but efficient aide, Jeff failed, to his embarrassment and chagrin. After many attempts at cordiality, Jeff had learned to confine their relationship to business, and tried, in all fairness, to take no advantage of his authority over the younger man.

In gloomy reflections, Jeff reached the river. He changed to his new glasses, and stood on the walk near the river-boat docks, scanning his surroundings. Leaning against a bollard, he gazed out over the river. There was a heavy mist, and rain waited in the wind; but his eyes were in the sun. Coolness fingered his face, but he looked through to tomorrow's hot stillness. His sober thoughts jolted back to the extraordinary lenses.

A mountainous steamship was gliding by with her escort of small boats. Faces of foam bobbed up, sparkling. Jeff traced the outline of the ship's name on the flare of the bows, too faint to decipher. His eyes sought the side of the pilot house—now he could make out some letters—an O and an AI. When the huge liner passed him, he craned forward and read *Saxonia* in white letters on the stern.

Several feet away, in the shadow of boardings around the excavations for the Battery-Brooklyn tunnel, Garey was idling. After a few bourbons in a noisy bar, he had drifted riverward, where he lingered often in nocturnal solitude. He had barely noticed the figure of the other man until something made him turn, straining astonished eyes.

The man's face was glowing.

In riveted disbelief, Garey got a second shock. The man was Jeff Horton. Garey looked dartingly about in search of glaring floodlights. There were none. *Yet his face was glowing.* Lithe, and tense, Garey stepped forward to speak, and saw the man go right past him, blind and unrecognizing, his spectacles flashing.

Baffled, Garey swerved back into the shadows. Jeff was gazing out over the river. Once, he stretched forward trying to get a better view of something, and murmuring indistinctly. Then he consulted his watch, and Garey bent down toward his own wrist. Now he saw Jeff take something from a pocket, and pushing the glasses up on his brow, scrawl briefly with his right hand. Returning notebook and pen to his pocket, he readjusted his glasses and continued his scrutiny of the river. Garey moved silently, trying to follow Jeff's range of vision. He saw nothing on the black water

but the boats that were always tied up at night.

At last Jeff removed the glasses and the glow from his face, turned, and walked away. Garey let him saunter some distance, before he lit a cigarette, and started homeward.

Interoffice communique from Time Research Central to Chronoscope Department, August 3, 2372.

SUBJECT: Report on signals recorded on Receiver E-4.

1. Subject report acknowledged.

2. Synthesis of opinion of Board members indicates that the vague and flickering signals reported, and their intermittent nature, do not indicate success in placing a new Chronoscope in the area scanned by the receiver. Signals of this nature have been known to occur when particles of a chronolens, or dilutions of the lens material, temporite, are subject to certain complexes of the Rhine factor—psychic aura. It would seem, therefore, that the reported signals merely indicate that some part of Chronoscope E-4 is in intermittent contact with some psychic to which it responds. Chronopsychic radiations vary greatly with the individual, and with the concentration of temporite exposed.

3. The Director instructs that records be kept, but that this work be carried out as theoretical rather than practical activity.

Jeff was signing correspondence when he heard the door close. A chill crawled along the back of his neck. He knew who would be standing in the door, just as he had glimpsed in preview, with a violence of loathing on his face. He knew also, that when he rose from his chair and cast his eyes upward, that look would be gone. Shoving a batch of letters aside, Jeff got up, raising his head to Garey's expressionless face.

That afternoon the office boy brought in the early edition of the evening paper. Jeff called to him.

"Would you mind looking up a ship arrival for me, Joe?"

"Was it due today, Mr. Horton?"

"That's right. It's called the *Saxonia.*"

Garey was on the phone. He clutched the receiver tightly, his narrowing eyes like green wires. Muscles tied, he didn't try to move until the voice in his ear compelled him to lower his head and speak gently into the mouthpiece. "What was that again? I'm sorry."

Garey was long practiced in self-control and deviousness, so he was able to observe Jeff without arousing suspicion. And he wished to observe him, very closely. Last night he had witnessed some provocative things. Linked to other isolated facts, the river incident was highly significant. This much was incontestable. Jeff owned a pair of phenomenal lenses, lenses which gave him unique vision. And he obviously did not intend to share his knowledge or he would have revealed it before now, being by nature a straightforward character.

Joe, the office boy, had flung the paper aside, saying: "The *Saxonia*

docked at 10:40 this morning, Mr. Horton. Pier 18." Garey put down his pencil, and leaned forward on crossed arms, ostensibly to study some reference material. He pieced together some curious scraps of information.

At 12:04 midnight, Jeff had looked at his watch and made notations concerning something on the river. Now he was comparing those notes with the arrival time of the ship *Saxonia*. Garey picked up his pencil, returning woodenly to his work. None of this made sense, unless—*Jeff had seen that ship hours before it passed.* Garey's fingertips froze on the pencil. Jeff's face had been glowing in the dark, almost as if his glasses reflected next day's sunlight! Also, Jeff had come nearly face to face with him, without even seeing him. Later he stood gazing intently over the water as if he was following the path of something that moved invisibly. 12:04 midnight. 10:40 a.m. today. It took a ship roughly forty-five minutes to dock after leaving the bay. Garey calculated rapidly.

Jeff had seen the Saxonia *ten hours before she arrived.*

Grinning wickedly, Garey shuffled the ruled papers under his hand. Everything was piercingly clear!

In the evening, Jeff sat home alone, contemplative—with the radio for choppy company. He was tired, his mood dismal. Things were increasingly unpleasant. He didn't know what to do about his glasses, and had been unsuccessful in his efforts to find a suitable scientific society to whom he might send the collected data. In addition, relations with his assistant were becoming intolerable. The memory of that look of ugly disdain, and Garey's progressively sneering attitude, rankled. He could leave his job, or demand Garey's dismissal, but neither course was practicable at present. He rubbed his brow, in deepening dilemma.

Going to the dresser, he unlocked a drawer. The buzzer growled. Jeff locked the drawer again and slipped the keys in his pocket. When he opened the door, Garey entered. Jeff whispered a polite greeting, and waited for his caller to speak. Garey smiled thinly at Jeff's undisguised perturbation, and loosened himself into a chair. As always, his arrogant face was unreadable.

"What do you want, Garey? I don't imagine this is a social call."

"Hardly. I'm not a sociable soul." He coiled long hands behind his head. "Ordinarily, I mind my own business. But I happen to be interested in something you have. Quite interested."

"What are you talking about? I had no idea we shared any hobbies." The words fluttered out meaninglessly.

"We share one hobby, if you wish to call it that. Those new eyeglasses of yours. Get rid of the silly, puzzled stare. You know what I'm talking about."

"You're being ridiculous. Why should my spectacles suddenly interest you?" Jeff's voice was on a tightrope. He shuffled nervously over to the liquor closet, and busied himself clumsily with bottles and tumblers.

"I mean your new wonder glasses, Jeff. The ones that give you such amazing sight. I'm interested for various reasons."

Jeff spilled some whiskey. Handing Garey a glass, he said, "You might as well have a drink and go. It isn't like you to waste time or conversation."

"I'm not thirsty. Since you seem anxious I'll tell you exactly why I'm here. Never mind how I know what I know. I just want those glasses, and I came to get them." He stretched up from the chair, lean and menacing.

The tumbler trembled, and Jeff put it down on the table. Unreasoning dread gripped him. "You better go."

Garey's fists closed, rock-hard. He stalked quietly to Jeff, who waited, shriveling.

The blows hammered at Jeff's neck, spinning him to the floor. Garey unknotted his fists and bent to rifle the unconscious man's pockets.

When he found the keys, he unlocked the dresser drawer, where he guessed the glasses to be hidden. The leather case nestled between piles of socks. He lifted it, opening it to make sure it contained its tortoise-shell treasure, before he pocketed it. Scraping a dry tongue over his lips, he glanced contemptuously at the feebly stirring man, and padded out.

A short distance from the house, he paused to put on the glasses, in the shelter of a dim doorway. They were large for his bony features, but they stayed on without slipping down.

At first his vision was blurred, and he grew dizzy. The outlines of houses tilted crazily, and street and sky shifted in a swimming mist. He took out a handkerchief and wiped the glasses carefully. When he put them back on ,they were slightly clearer, and after a few minutes he could see enough to walk. He squinted along anticipating some fantastic effect. Nothing happened except that as his eyes forced themselves to adjust to their strange props, his vision improved. Things were still filmy and out of proportion, however, and time did not take a great jump forward. A clock in a store window indicated that a half hour had passed between the time he rang Jeff's bell and now.

He stumbled along, hopefully determined. Perhaps the transformation would occur slowly. Maybe he should go to some optician and have the glasses fixed to suit his eyes. But that might cancel their power. He'd have to wear them as they were, and be patient. He had gone to a lot of trouble to get them, and sooner or later it had to bring the results he wanted.

Wonderful dreams of racetrack winnings and stock market success paraded through his mind. Confidently, he stepped off the curb, then paused to let a speeding cab go by.

But it didn't go by. Horn blasting, tires screeching in a skid, it bore down on him. He saw it looming massively above him.

In head-cracking pain, Jeff emerged from oblivion. Struggling up, he looked foggily around. In a flood of rememberance, he lurched across the room to the dresser, and clawed through the drawer for his missing glasses.

Half sick, clothes awry, he ran unsteadily down to the street. As he neared the corner, he saw a careening taxi heave like some maddened, unleashed monster up over the curb, and across the sidewalk. In a paralysis of horror, he watched Garey leave the safety of the street to step back on the pavement in the path of—under—the oncoming cab.

Something curved glittering high in the air, and fell to fragments incredibly at Jeff's feet. He stooped to gather the mottled, weightless frames. Straightening slowly, he stared at them; and gradually the realization of the power he had lost outweighed his shock. His fingers slipped inside the frames, around the futile grooves which had held, for a while, an undreamed-of power.

There were so many things he had not tried yet!

Footsteps echoed in the wakening street. Sashes swished open and heads punctuated the regimented windows. People rushed past him to the wreck and the tattered body under it. A stout man in an undershirt jostled him.

"Oops! Sorry." He pointed to the empty frames Jeff held in his numb hands. "Did you break your glasses?"

The beginnings of the regret that would haunt him all his life were in Jeff's voice as he answered, hoarsely, "Yes, Yes, they're broken."

Nyork,
Janevery, 2501.

Dear Jo,

Here's a chance for you to reiterate your old claim that I am an incurable romanticist. But here's the story.

In going over the records of the Twenty-fourth Century Time Researchers, I have run across many interesting things. Of course, as you would imagine, they did everything the hard way in those days. But with their primitive equipment, they did manage to unearth a surprising amount of information about the nature of time.

The thing that tickled me was a little case history I ran across in the old records. It seems that something happened to one of their Chronoscopes—those little devices they scattered back in the time stream which would radiate visually, everything that happened within their range. Well, one of them was destroyed. Since they hadn't the technique of making an accurate replacement, they failed in their attempt to send another one back to precisely the same area in time. But they left the receiver on, and got a series of faint flickerings and hazy impressions. These made no sense to them. When the signals ended, they left the receiver on for a few months and then consigned the whole matter to the files. But to me—I've been studying the records for days now—they are fascinating.

I won't bother you with the intensities and co-ordinates and whatnot of all this data. You're a mere artist and wouldn't be interested, but this is what I gather from it. Try to imagine yourself in the position of one of those half-savage, aboriginal ancients of the Twentieth Century, in such a spot.

The Chronoscope, which was made in the form of a figurine aesthetically gratifying to the inhabitants of the period, so that it would be kept out in the open, was destroyed in some way which alloyed it—diluted it. Perhaps it was dropped into molten glass, or some such thing. It was made of temporite, which is a substance profoundly affected by psychic forces.

Now, imagine this. Suppose someone back in those dark times got hold of a piece of this alloyed temporite. Looking through it—granted, of course, that his psy pattern matched the temporal-spatial crystallization of the material—he would be able to see into the future!

The beauty of this supposition is that the "distance" he could see would depend completely on his psychic pattern. For one savage it might be a year; for another, ten minutes; for another, thirty hours.

It seems to me that the records of this old chrono receiver bear out such a tale. One man got hold of it—in what form is hard to say—and could see, we'll say, ten hours ahead. He probably gained something thereby—imagine yourself as the only man on earth who could see ahead! And then one of his fellows learned of his powers and stole the temporite from him. But within minutes, this second man, whose pattern shows up so vividly on the records, was killed and the temporite smashed forever. I can conclude only that the thief thought that he, too, would see ten hours into the future, but actually, could see only a few seconds. It is easy to picture him seeing death approach him, three seconds ahead, and perhaps reflexively leaping into its path. What magnificent justice!

Well, perhaps this little explanation of hazy and forgotten records will be of some use to you in the creation of one of your fantasies. I for one, would give a good deal to know what actually happened.

Good-by for now. I'll "simil" you again when I run across more useless, romantic information.

As ever,

Teev.

THE END.

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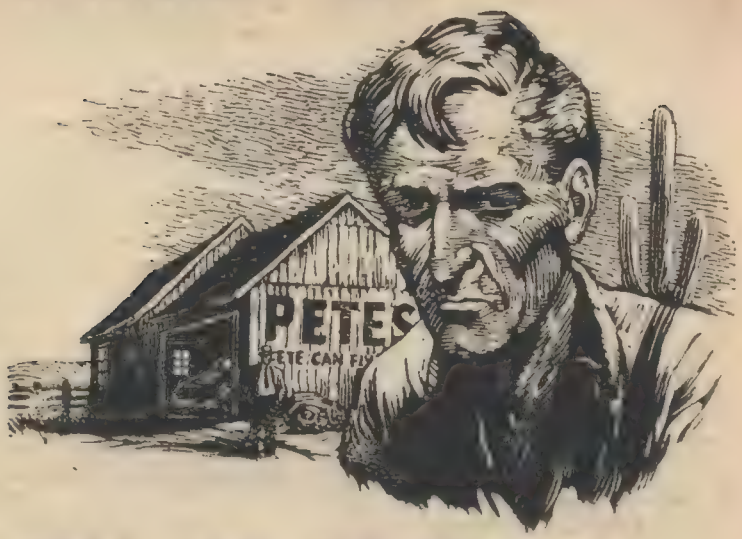


PETE CAN FIX IT

***Pete** might not be able to fix what he was really trying to repair. But he, in his strange garage, was making a try—*

Illustrated by Orban

It was just outside Wickenburg, Arizona that Ralph Grandin noticed the first of the signs. In the faint desert dawn he nodded towards it with a laugh. Marcia, his wife, followed his glance with her eyes.

"Pete Can Fix It!" She read aloud. "We'd better find Pete quick, then, before the car finishes its collapse."

"It would take more than a guy named Pete to doctor our galloping Susie." He patted the steering wheel of their '38 Chevy fondly as it rattled along the highway at a mean 45 mph.

Thirteen-year-old Jack, their son, looked disdainfully from the back seat. Whatever the skills of the unknown Pete, Jack was certain that *he* could do a job ten times better on anything mechanical.

Wickenburg faded quickly out of sight and the hush of the desert was broken only by the car's dissonant noises. This was the summer of 1946, the first vacation in five years for Professor Grandin and his family. Grandin had turned down an opportunity to be in on the Bikini farce. His work on radiation measurements would profit more by a good vacation. Besides, he would be seeing Mason at the University

in Los Angeles to show him the new detector he had developed. He needed a good chin fest with somebody like Mason, and the detector was the best excuse in the world.

"Look. Pete's with us again." Marcia pointed to the desert landscape on her side of the road. Another of the weatherbeaten signs declared in bold black and white: "Pete Can Fix It."

"Remember that new Burma Shave we saw in Nebraska—?" said Jack.

This was swell, thought Grandin. Just like the old times, it seemed. But he knew it wasn't. Never would be again. Funny how people thought you could go back to something you'd had before when that something was so rotten it had collapsed of its own weight.

Bikini is a bust, he thought, and too many of the atom boys have turned to collecting butterfly wings. There was no going back to the past, but if there were only some way out of the bumbling, nerve-shattering idiocy of the present—

Pete Can Fix It!

The irrefutable assertion seemed to lurch at them out of the desert wastes. Grandin found himself welcoming the signs. There was no indication as to where this multi-dexterous Pete was located or what he could fix, but the calm assertion that Pete could fix it was like some familiar landmark in a barren, fearful wasteland.

"Wouldn't it be wonderful if we could turn the whole world over to Pete?" Marcia suggested whimsically. "If we could just hand him the whole mess and say, 'Here you are, Bud. Send the bill next month.'"

"That's the trouble now," said Grandin. "There've been too many Petes who thought they could fix it—and we're paying the bills."

"He's probably a hick in a one-horse garage by the side of the road out in the sticks," said Jack disparagingly.

Grandin chuckled tolerantly. Jack would no doubt be the match of a dozen Petes when he grew up. The boy's intuition for mechanical and electrical tinkering was little short of genius. He had the run of the laboratories over which Grandin presided and spoke of deutrons and neutrons with the same familiarity that others of his generation spoke of baseballs and Boy Scout hikes.

Jack wasn't a prodigy—Grandin and Marcia hoped. But he was a smart kid and might grow up to be a darned useful citizen if he could be steered right, a problem that absorbed Grandin's interest equally with atomic bombs.

Over the magic and the mystery of the desert the cryptic signs led them and, all at once, twenty miles out of Quartzsite, they saw it—a ramshackle garage with a single gas pump.

It bore the giant inscription that covered an entire wall: Pete's. In small letters was the final, uncomprising declaration: Pete Can Fix It. It was small and less bold than it had been on the desert signs, as if ashamed of the reality which was

shabby in the face of the bold proclamations.

"I was right!" Jack exclaimed jubilantly. "I'll bet he doesn't know a timing gear from a cam shaft. Let's stop for gas and look around, Pop."

"O.K." Grandin laughed. But somehow he felt a sense of unnamable loss, a nostalgic disappointment as if some childhood dream had vanished when the battered building came into view.

A few chickens cackled furiously out of sight as Grandin drove up. He turned off the motor and the swelling silence of the desert poured over them. It shattered suddenly before the pounding of metal that sounded from within the dismal garage.

"Hey, somebody's here all right," said Jack. "Look at that car that he's working on—!"

Grandin and Marcia peered into the dark cavern from whence the sound came. They glimpsed the flicker of a mechanic's lamp and the shining outlines of a new model Cadillac. Something of Grandin's disappointment was dispelled.

"At least this Pete gets the top drawer customers out here," he said with a laugh.

A figure crystallized from the dimness and shambled towards them. He moved as if with extreme effort, slowly, like some unknown denizen of that dark cavern in which he lived and worked.

In the sunlight he was a man of uncertain twenty-five to thirty-five. He moved stiffly as if from painfully arthritic joints. And even beneath the layer of grease and grime that incrusted him they could see the splotched skin, great discolorations that seemed to speak of some unwholesomeness beyond endurance.

He approached the car. "How many?" he said.

Grandin and Marcia let their gaze move towards the mechanic's eyes and with the sudden glimpse into the depths of that intense blue there came an almost tangible shock. There was something in the man's face, a searching, frantically inquiring something that was ravenous, frightening.

Grandin swallowed. "Fill the tank," he said.

He got out to unlock the gas cap, almost consciously avoiding the eyes of the man.

"You're Pete?" he asked.

The mechanic nodded, inserting the nozzle into the tank.

"We saw your signs all the way from Wickenburg. We wondered just where you were. Seems you have a rather out of the way location for a garage."

"Sometimes cars pick out of the way places to break down," said Pete.

His glance darted about—from the pump indicator to the tank to the interior of the car and back to Grandin's face. "Mind," he said hesitantly, "if I ask your name?"

"Well—no, it's Grandin. Ralph Grandin."

"Grandin—" Pete seemed to test the name with his tongue as if searching for some old, forgotten memory. Then he shook his head

faintly as he replaced the gas hose and locked the tank.

"I thought maybe I had seen you before," he said. "Your little boy —he's about twelve, isn't he?"

"Jack just turned thirteen. Well, thanks, what do I owe you?"

Pete remained motionless, staring intently at Jack as if trying by the very power of will to shape his image in the form of something familiar but forgotten.

"I traveled along this road when I was a little boy," said Pete slowly, his eyes far away. "My mother and father took me somewhere and we came this way—when I was just about the age of your boy."

Grandin held out a ten dollar bill. Pete looked down at it as if memory and consciousness were struggling back from some far vista that ordinary men could not see. "When I was a little boy—" he said absently. "But I don't know where we were going—"

Then he seemed to become aware of Grandin and the money. "Let me check your oil. Bad to let it get low out in this hot country."

"Hurry, Ralph," said Marcia. "It's hot in the car."

"Better get out and have a cold drink. I'll see if he has some cokes in the box over here," said Grandin.

He started towards the store half of the place, where aspirins and piston rings were stacked side by side on the shelves. Jack darted out of the car and leaned over the fender while Pete checked the oil. In vain Marcia tried to motion her son back from getting close to Pete's loathsomeness.

"Hey, what are you doing?" Jack's voice suddenly pierced the still, desert air. "Hey, Pop. This guy doesn't know a distributor from an oil stick!"

Grandin turned after closing the lid of the empty soft drink cooler. "What's the trouble?"

He came up as Pete extracted one of the points from the distributor and held it up. "This won't get you much farther mister. It's about ready to burn right out of the spring arm."

Grandin squinted at the blackened metal disk which was truly almost nonexistent. "Guess they do need replacing, all right."

"Seventy-five cents, installed," said Pete with eagerness that was somehow repulsive as if he were a crow snatching at crumbs from a rich man's table.

"All right. Put in some new ones."

Pete moved away with the jerkiness that betokened intense pain.

Jack whispered hoarsely. "Pop, he didn't get that burned out point from our distributor. He had it already in his hand and palmed ours! I saw him."

Grandin looked down at Jack's earnest excited face. He grinned uncertainly. "That's silly. You must be mistaken, Jack. What would he do a thing like that for?"

"I'll bet a guy in a run-down shack like this would do anything for a six-bit sale."

"Well, it won't hurt us to give it to him then. The poor devil must

just about starve to death out here anyway. And he looks terribly sick, besides."

At that moment another figure emerged from the darkness of the garage. A portly man in an expensive suit, and smoking a black cigar, stepped into the bright sunlight. He ambled towards the car as if in resigned disgust.

"Hello," he said. "I see the old coot stuck you for something, too."

"He's just changing our points," Grandin said. He didn't advance the conversation any further, but the man remained.

"That's what I meant. I've been here for three hours trying to get a generator repaired. Not many people stop but since I've been here that old guy has managed to sell every one of them some parts or service. He must be a wizard the way he can put his finger right on a car's pending trouble. If he didn't look like a zombie, and were in a good location he ought to be able to clean up in this racket."

Grandin made no reply.

The man moved back towards the dimness of the garage where his Cadillac waited.

Pete returned and installed and adjusted the new points. He replaced the condenser as well, and charged nothing extra.

He closed the hood with a snap. "You'll get there all right now," he said with a wry smile, "and if anybody asks about me, just tell 'em Pete can fix it!"

The shabby garage and the queer mechanic with the loathsome appearance, and the beefy man with the Cadillac disappeared from view as the Chevy moved on. Jack and Marcia settled back in their seats and conversation lagged as the miles of highway flowed beneath their wheels.

"We can have lunch in Blythe," said Grandin at last.

"His eyes—" said Marcia. "I can never forget those eyes. They made me think I'd known him somewhere before—"

"I know what you mean," Grandin replied slowly. "I sort of felt the same way. Strange we should both feel the same."

"I hope we never see the dope again," said Jack. "He gave me the willies. And chiseling for six bits—!"

The desert sky turned copper in the afternoon sun and a pall of heat and depression overshadowed their vacation spirits. They wished for the sight of the ocean and the flashing whitecaps of cool waves.

They were just outside Indio when the powerful Cadillac they had seen at Pete's roared by at eighty miles an hour. The lone driver hugged the wheel intently, his ever-present cigar tight between his lips.

"He'll burn out more than a generator if he keeps that new buggy going at that rate," said Jack scornfully. "That guys like him should have what it takes to get new cars—!"

Ralph Grandin was thinking along the same lines, but not aloud. He was thinking of the past four years and the things he'd done with his

life. His part had been small, but nevertheless he had contributed to the weapon that seemed destined to wipe out the world—and he felt his life had been wasted. What to do with the rest of it, he wondered. He felt an almost spiritual, psychic need to devote it to atonement for helping to bring prematurely to mankind the Promethean atomic fires that threatened to burn down the earth.

He was becoming mystical, Grandin thought in self recrimination, but that didn't ease the gnawing urge to fill his life with some grand ideal, some possessing goal to fill his emptiness.

He didn't know when the change came. It was mid-afternoon and they were a few miles past Pomona when he first noticed it. The sky that had been copper over the desert became more glaring and golden. An eternal pall of dust seemed to fill the air.

There came a sudden, sharp, wrenching jar that made him think the steering gear had snapped. But in an instant he regained control of the car. He glanced in the mirror to see what unseen bump in the road had caused the jolt.

Marcia's face was a little white with the shock of it. "What in the world did you hit?"

"Nothing. Something must be wrong with the car. But it seems to be O.K. now."

He drove on, alert for trouble, but nothing else occurred. Gradually, his tension eased and he stepped harder on the gas.

"I wonder where all the traffic went," Jack remarked. "It looked like every man and his dog was on the road a little while ago."

Grandin noted that he had been unconsciously aware of the same fact. The road did seem deserted all of a sudden, but more than that is was the *houses* at the occasional crossroads that looked deserted and in bad repair. The road itself seemed veiled in drifted sand and dust in which few tire marks showed themselves. It was as if they had suddenly driven into a new and strange world—a dead world.

"Ralph, we must have gotten onto the wrong road somehow," said Marcia. "Maybe there's a new cut-off and we just kept on the old road. Hadn't we better go back?"

"No. There are the highway markers up ahead. Anyway, we'll soon be in Los Angeles."

Grandin didn't believe his own assurances. His puzzlement grew as the deathliness of the scene increased. Then, at West Covina, they began to see the first of the bombed-out buildings.

Marcia gave a faint, shrill cry. "Ralph! This place looks like there's been an explosion!"

There was debris now even in the four-lane super highway on which they rode. Grandin slowed and twisted the wheel to avoid the rubble.

"We should have heard any blast big enough to do all this," said Jack. "When do you think it happened?"

"I don't know. We saw newspapers this morning. There was nothing about it then."

Past West Covina, the evidence of destruction didn't diminish. At every cluster of homes and buildings it increased. And at last, when they were in a position to glimpse the full skyline of Los Angeles they stopped in horror. As far as their eyes could see there were only skeletons of buildings, vast heaps of rubble and debris—and nowhere any life.

"Ralph—!" Marcia's hand gripped his arm painfully and her voice was shrill with fear.

"It looks like the pictures of an atomic bombing!" Jack exclaimed. "But it couldn't be. We'd have heard it."

Instinctively, their eyes sought the sky, but not even a bird soared overhead.

"Let's go on a little farther," said Grandin soberly.

"I'm afraid of it," whispered Marcia. "Let's not get any closer. Let's go back to . . . to some place that's alive and find out what's happened here."

"Just a little farther, then we'll go back. I want to make sure—"

Grandin opened the trunk of the car and removed the carefully packed detector that he had brought to show Mason. He set it up for operation on the front seat between Marcia and him. Slowly, he started down the half choked highway.

There was scarcely any need of going farther. On its most sensitive setting the needle of the indicator was pounding the pin, indicating the intense radioactivity of the atmosphere about them.

"An atomic bomb," said Grandin dully. "More likely a dozen of them to give this radioactivity. And we didn't even think anyone else knew how to make a bomb—!"

"But we didn't hear or see a thing!" Jack protested.

"I know— That's what I can't understand."

"Could it have been that bump we couldn't figure out?" Marcia said. "That felt almost as if we had been picked up and twisted around and set down again."

"I don't know . . . I just don't know," said Grandin. "All I know is that it has happened. Whatever else it means, the same thing must have happened to every other large city in America. And we weren't ready for it. This is A.D. 1946, the New Stone Age."

They stopped and got out of the car and stood close together silently viewing the vast wreckage of the city. Grandin tried to pick out the bomb craters. He thought he could see four different ones, but it was hard to be sure.

He knew that their minds were too small to comprehend the immensity of the disaster in all its panoramic horror. But, fragment by fragment, like spewing bits of the bombs themselves, it penetrated their comprehension, each piece leaving its own aura of fear and desperation which combined with the others to form a swelling bubble of panic like a ball of incandescent gas about to explode within them. Through the days and nights to come the bubble would grow until at last they came to know that their world and all its connotations were

dead, and they would have to live with that knowledge to the end of their bitter, miserable lives.

Marcia began to weep softly. Jack clung to Grandin's hand with young fingers of steel. "What do we do now?" he asked with restrained emotion.

"Away from the cities," said Grandin slowly. "There may be some semblance of technology surviving. It's doubtful. Chaos, invasion, formation of warring tribes of our own people—until we find out what's happening we'd better isolate ourselves. We'll try to find food and gas and head inland towards the mountains of central Arizona. It's our best hope for survival."

"Ralph! There's a car coming!" Marcia pointed down the highway.

For a moment they watched as if the appearance of a moving object were some strange miracle in this land of death.

"It's the Cadillac we saw at Pete's," said Jack.

The reckless driver weaved through the rubble and skidded to a stop in a cloud of dust before them. Abruptly he was out and moving towards them on foot. Marcia screamed at the sight of the gun in his hand.

"What do you—?" Grandin began.

"Things have changed." The man's dead cigar shifted in his mouth. "You can see that. In case you don't know it we're probably the only ones left alive in all of Los Angeles. I'm heading north, but there's no way through the city. I've got to go around. Lucky I came this way. I'm going to need all the gas I can get. Put yours in my tank and be quick about it."

"But we can all go together!" said Grandin.

"Nuts. We're back to the level of every man for himself, folks. Civilization and that 'Do unto others—' stuff is as dead as the million corpses all around us. Get busy, fella! I've never killed a man before, but I've an idea I'll have plenty of it to do to keep myself alive from now on. It's not too early to begin."

As if in a trance, Grandin moved towards the rear of his car. This is a dream, he told himself. In a minute I'll wake up and find none of it is real. I'm Ralph Grandin, Professor of Nuclear Physics and Marcia and Jack and I are taking the vacation we've looked forward to for so long. We aren't standing on the ruins of Los Angeles being robbed of the gasoline that is our only hope of food and life.

He slowly unlocked the trunk to get the quart can he carried and the pliers. As he did so there came a sudden shout behind him. He whirled about in time to see the robber falling to the ground and Jack wrestling for the gun.

"Jack—you fool!"

At the same time, a surge of admiration that was almost painful went through him. The wiry figure of the boy hurtled at the beefy man and then was darting away, gun in hand.

"He might have shot you!" Grandin exclaimed. "You were a fool—a wonderful fool."

"Wait a minute," said Jack. "I didn't tackle him all by myself. *She* did it, really. She threw a rock that got him in the head. He was down before I jumped him."

"She—?"

Grandin turned in the direction of Jack's gaze. Coming over a nearby pile of rubble were the figures of a woman and two men. All of them were dressed in the tattered remnants of clothes that had been cut to mere shorts and the woman's halter.

"That was a close call," one of the men said.

Suddenly, the woman stopped. As if transfixed, she stared at Jack. Her hand clutched the arm of the man who had spoken.

"Brad! It's . . . *him!*"

Something about her voice electrified Grandin. The intensity, the terrifying possessiveness, the way she looked at Jack—

"Delsa . . . no, you can't be sure," the man cautioned.

The man turned to Grandin. "Won't you join us? We have a hideout over here a short distance. We'll exchange what information we have about this mess."

Grandin had been moving for-

ward slowly. Quickly, he took the revolver from Jack's hand. He held it before him.

"No—" he shook his head. "We can't risk it. How do we know you aren't—like him?" He nodded towards the prone form of the Cadillac owner.

"You don't, I suppose. I'll admit there are plenty like him. We have to be on constant guard against them. At least we can sit down and talk."

As Grandin's lips moved to speak, the woman pointed towards Jack again and whispered intensely to her companions. "I know it's him. I know it is. Oh, don't lose him!"

In Marcia's frightened eyes appeared sudden terror. "Ralph! She's crazy. She must think Jack is her dead son or something. Oh, let's get out of here—anywhere, just until we can think again!"

Grandin nodded. "We don't know what's happened," he said to the strangers, "but for the moment we want only isolation and time to think. We're heading east again. We aren't deserting you because there's nothing we can give you. Maybe you're better off here than we'll be. Maybe we're fools, but that's the way it is. Get in, Marcia and Jack. You turn the car around, Marcia."

As the car spun around, the man who had not spoken made a half-hearted attempt to come a step or two after them. Then he shouted suddenly, "Tell Pete you saw us! Tell him Delsa is not well!"

The words bored into Grandin's consciousness and exploded. He stopped Marcia. "Pete—" he demanded. "What do you know of Pete?"

Before the other could answer, the woman, Delsa, broke away and ran towards the car. Her cries were hysterical. "You can't take him now! Not when we've just just found him—he belongs here!"

Her fanatic gaze was on Jack's white, stolid face. Marcia whispered frantically. "She's crazy, Ralph. I'm afraid of them."

She started the car again and sped down the highway. When the three strangers were out of sight, Grandin took the wheel and began a search for gasoline.

He drove automatically with the attention of only a fraction of his mind while the bubble of fear grew. Why was he running away from the three who had come out of the ruins? Already he had abandoned the most elementary amenities of his dead culture. All at once every surviving man had become the enemy of every other man in the bitter struggle for remaining food and necessities of life. It was as if an unseen vapor had risen from the ruin of the bombs and congealed about their hearts, setting every man against his kind. Later, of course, there would be tribes, wandering, warring tribes. He would want no part of that, he thought, but perhaps it would be essential.

There was another reason that had driven them away from the strangers, however, he told himself. The light in the eyes of the woman they had called Delsa. Her

eyes upon Jack. The possessive compulsion Grandin saw there chilled his soul. He understood Marcia's sudden dread. It was that that drove them away. He was not yet ready to declare himself against every man. But what if no man remained who could claim his ties? If they were all murderers, thieves, insane—?

The gasoline search was hopeless. Every station had empty tanks. The locks of the storage tanks had been broken and the last dregs drained away.

"Everything points to the fact that the bombing occurred long ago, yet it must have happened within the last twenty-four hours. Without gas we can't cross the desert. If we can't find any at all, we'll try to find a spot with a flowing well and settle. From there we can explore and find friends—unless everyone has become like those we've seen."

"Maybe we should have stayed—"

"There's no use in our trying to persuade a strange, unbalanced woman that Jack is not her son or some loved one lost in the bombings. She'll be better off without us."

In the back seat, Jack was completely silent. Grandin wondered what thoughts were passing through the boy's mind, but dared not ask. He had just come out of the years of childhood with the concept of the world beginning to take shape in his mind. Now that entire world was utterly changed without the sight or sound of the processes of change. As Marcia had said—it would not have been so bad if they could have seen the rockets and heard the sound of the bombs.

Dusk began to settle over the ruined landscape. As the darkness deepened, Grandin debated turning on the lights and decided that it would make them no more conspicuous than they had been during the daytime. On the dust covered road he could not distinguish the many shapes of broken bricks and rocks. Dozens of times the car jolted and swerved and Grandin groaned and prayed that the tires would not blow.

He didn't know just when it was that he first became conscious of it, but when he did he knew it had been there for a long time—the sound of another car behind them. Suddenly, the lights of it flashed upon them, blinding Grandin with their glare in the rear-view mirror.

At once he thought of the man in the Cadillac. He picked up the gun that lay on the seat where he had dropped it. He edged the car over and slowed.

Surprise rocked through him when the occupants of the other car merely honked and roared past. And in the light of his own headlamps Grandin saw plainly that it was not the Cadillac. It looked more like a bunch of high school kids in a hot rod.

Then the lights of an oncoming car flashed into their eyes as they rounded a curve. Marcia gasped and pointed ahead. "The lights! It looks as if the whole town of

Pomona is lit up as usual. Maybe things aren't as bad as we thought."

"I wonder. There may be complete chaos there. It might be better to by-pass the town."

But, as they advanced slowly, there was no evidence of confusion or disturbance. Streams of cars were moving in the direction from which Grandin had come.

"It doesn't look like they've even heard about it," said Jack.

They passed through a quiet residential section and came to the edge of the business district.

"How can things be going on in perfectly normal fashion here when Los Angeles is in complete ruin only twenty miles away? There should be refugees—"

He pulled up to the curb before a policeman who stood idly watching the movie crowds.

"Aren't the roads to Los Angeles closed?" Grandin demanded. "Hasn't word of the city's destruction been even heard over here?"

For an instant the policeman gaped, then he burst out laughing. "Another one! You're the fourth this week. Say, Bud, just what do they sell in bottles down in Los Angeles? The town bombed again —when's it going to end? I'd run you in, but they had to let the other three guys go when they proved sober. But get going before I change my mind!"

Dazed, Grandin pulled his head back in and stared at the lighted show windows. After a moment he got out and went into the nearest drugstore. He came back and tossed a newspaper into Marcia's lap—the Los Angeles *Examiner* of current date. Headlines were devoted to city hall scandals and a Hollywood murder.

"Maybe it didn't happen," said Marcia thinly.

"Say, we weren't dreaming it!" Jack protested. "I didn't dream I was tussling with that fat guy for the gun!"

"Look!" Marcia pointed suddenly to a small item at the bottom of the front page. Grandin glanced at the article.

"Los Angeles Bombed," Says Visitor

J. B. Winkler reported to Pomona authorities yesterday that Los Angeles was in ruins, apparently the result of a terrific bombing. Winkler, arrested on a charge of drunkenness, was found to be cold sober, but was being held for psychological tests before—

Grandin slumped as if something tangible had been exuded suddenly from every pore of his body.

"Mass hallucination—" he said slowly. "How can you explain anything of this kind? It's something that belongs in the collections of Charles Fort and his kind. It's the sort of thing that happens once in a lifetime to one person in a million, and which he never dares repeat. I suppose we can never know. Maybe it was some form of premonition, some flash of vision of the future, or of another plane. Whatever it was, we know now that it wasn't real." He glanced back down the highway where bobbing taillights were vanishing in the

direction of Los Angeles. "I've lost all taste for a vacation on the coast. How about it?"

Marcia nodded. "Yes . . . let's just keep going—back. I want to forget the awful sight of those ruins, and that crazy woman reaching out for Jack—but I know I can't really forget it as long as I live."

Grandin stepped on the starter. The motor barely turned over.

"Looks like battery trouble. We'd better stay here for the night and get a fresh start in the morning."

After half a dozen futile tries, Grandin finally managed to get the car to start. He drove it to a garage and found a nearby hotel room for them.

The night's rest made them realize how deep their exhaustion by the events of the day had been. Next morning they found the car ready when they called for it, but the garage man looked at Grandin in puzzlement.

"That battery of yours was completely shot," he said. "I checked over your ignition system for shorts and found this dingus in your distributor. I don't know what you were doing with it there, but it was sapping your battery to death."

Grandin glanced at the small cylinder the man placed in his palm. "I don't know what the devil this is. How could it get in—?"

Then his mind went back—Pete, his pain-wracked form bent over the car, working on the distributor.

"It was fastened to the condenser," said the mechanic, "and your condenser was a cutdown size. I put in another one. It should perk all right now."

"Yeah . . . O.K. Thanks," said Grandin absently.

Pete, the little shiny cylinder—and the man named Brad who said to tell Pete they'd seen him. Suddenly, Grandin knew where he was going. He spoke with fierce intensity.

"We've got to see this fellow, Pete," he said to Marcia.

She looked at him as if trying to read his thoughts. "Do you think *he* made it happen to us, somehow?"

"I don't know what I think, but he's the only connection between reality and this dream or vision or hallucination or whatever it is. I'm going to find out what Pete's got to do with it."

"Unless Pete was part of the hallucination too—"

"This cylinder isn't!"

"Let's open the gadget," said Jack.

Grandin held it up between his thumb and forefinger. The case was rough as if it were some home-made experimental model. He took out his pocketknife and pried off the end opposite the terminals.

At first glance the interior looked like a burned, shapeless mass. Then Grandin saw that it was a mass of small wires burned and fused. Carefully, he tried to pick among the destroyed components, but they shattered at the touch of his blade. Only one thing came

out whole, a small object that looked like a glass bead. He held it up to the light and rubbed the discoloration from it. He gasped in amazement.

"It looks like an electronic tube of some kind!"

"Maybe this guy Pete isn't as dumb as he looks," said Jack.

The heat of the desert radiated about them and filtered into every cell of their beings as Grandin pushed the decrepit car to its limit over the burning highway. By early afternoon they arrived at the shambles of Pete's garage.

There was no sign of life. All the doors were shut and the windows were obscured by weeks of undisturbed desert sand and dust.

"Bet he flew the coop with the cops on his tail," said Jack.

Grandin got out and pounded on the door of the building, but there was no answer. He tried again. Suddenly, Marcia, sitting in the car, waved and pointed to the west side. Grandin and Jack ran around the corner just as a car drove out. It was in even more battered condition than the building, and Pete was at the wheel.

He looked worse than when they had seen him the day before. Whatever repulsive illness possessed him, its ravages were terrible and progressive.

"Closed up," said Pete. Then his eyes went wide. "You're Grandin—and Jack! You came back."

"Apparently you didn't expect us back."

The man looked at them for a long moment and slowly the light died out of his eyes. "I didn't know. It's of no consequence. I must be going now. I have business in Los Angeles and my garage here will not be open any more."

"Aren't you installing any more of these?" Grandin held out the little gadget he had partly disassembled.

"No," said Pete slowly. "I guess I won't be installing any more."

"Come on," said Grandin with unexpected savagery. "I want to know what this is all about. We went to Los Angeles and found ruins there—ruins created by atomic bombing. "I've got a detector that showed the radioactivity—"

He stopped. His eyes, on Pete's face, registered first disbelief then astonished recognition.

"Those sores—they're radiation burns! I should have known—"

Pete nodded slowly, painfully. "Yes, now you understand?"

"No. I don't understand anything. Los Angeles is not destroyed."

"But it is. So is Washington, New York, Chicago and a hundred other cities we've been so proud of. They are destroyed in this continuum—fifteen years from now."

"Fifteen years from now!"

Pete nodded. "I came from out of that time—came back to try to find a way to prevent the holocaust that I have seen. In my day I saw the bombs fall and our cities wiped

out in flames. As far as we knew more than seventy million were killed before communications became utterly impossible. After that, there were only scattered bands in the Los Angeles area.

"The first thing I tried was to establish communication with other groups. During the electronic experiments I discovered the principle of that." His fingers indicated the cylinder.

Grandin glanced down at it. "The principle—?"

"During the unprecedented release of atomic energy that arose during the simultaneous bombing of our cities something happened to the very time continuum in which we exist. Don't ask me what or how. I don't know. A crook, a twist, a fold—explain it how you will, I accidentally stumbled upon an electronic circuit that would create a field that would enable passage from one folded section to the adjacent section. The fold proved to be about fifteen years in length, so that I found it possible to pass from the time shortly after the destruction to this period."

Grandin listened as if in a trance. Jack's face reflected sober incomprehension. Marcia had come up and now stood listening to Pete's story.

Disbelief struggled with memory in Grandin's face. "Why these?" he said at last, holding up the cylinder.

Pete closed his eyes momentarily against some unknown well of pain. "Suppose—" he said. "Just suppose that every living man could see the horror and feel the desolation and fear that you have seen and felt. Do you think men would allow it to happen if they could know the fear that you have known?"

"It would never happen," breathed Marcia fervently, "if every man could see that world of death."

Grandin glanced down again at the little cylinder. He felt suddenly cold in the blazing radiance of the sun. He looked into Pete's eyes, saw there the searching, the intensity of a dream to turn aside the course of the world.

"That is my hope and my dream," said Pete slowly, when he saw that Grandin was not going to speak. "I built these—" He indicated the cylinder again. "They can be attached to any vehicle. When the vehicle moves across the line where the fold of the time continuum appears, a shift to the future occurs, or vice versa. I have developed an improved ignition system for automobiles, and an improved carburetion method which will double gasoline efficiency. In both of these devices is incorporated the time changer. I supposed that it might be possible to sell some such device to the auto manufacturers, distribute others through garages, filling stations, and so on. Eventually, millions of cars would be so equipped. Near every city they would be driven through the time fold and their occupants would witness the ruin their own folly was to bring.

"Only once would the vision be

experienced. The time changer is built to be self-destructive on passing back to this side of the fold. But in the mind of every man who saw that vision would burn the reality of the horror to come. It might be enough. I don't know. But reasoning, argument, pleading will never keep man from pulling down the world about his own head. Only fear, terrible shattering fear of the consequences can persuade him to turn aside from self-destruction Perhaps a vision of the world lying in death can instill that fear.

"There are other ways to utilize the principle. I have applied it to radios and television sets. Thus, these would give for one terrible period of revelation the sight and sound of a dead and dying world. In every country around the Earth I hoped that I might recruit agents to help in the distribution of these devices. It's a gigantic task, one that might occupy the lifetime of a well man.

"I'm given no more than a single year to live, and the pain is too great to work more than a few hours in a day. There is no one in my own age to carry on my work. You can imagine what would happen if I tried to get the scientists of this period to listen to me. They'd laugh at me as a crazy, deluded man even if I showed them the time changer."

As Pete spoke, he watched the reaction in Grandin's eyes. He saw disbelief change to bewilderment, and slowly melt to uncomprehending sympathy.

"And you do not believe me, either," he said sadly. "I've never told anyone else this story. I thought perhaps you would . . . I just thought you might—"

Very suddenly, he stopped talking as his eyes looked distantly down the road. A battered vehicle as decrepit as his own was shambling up the highway. As it approached the garage it turned into the driveway leading to Pete's.

Grandin's eyes widened and changed as if a specter had loomed in the air before him. And then dawning belief in the unbelievable and the unreal spread over his face.

The woman, Delsa, and the two men who had appeared with her in the ruins were emerging from the car.

Pete, watching Grandin's amazed countenance, said softly, "The necessity for my trip has ended. Won't you all come in where we can talk?"

In that single moment, watching the three strangers reappear, Grandin felt the loss, the sudden terrible collapse of all his logic and reason, his prejudices and a thousand beliefs and faiths. He had even been ready with an explanation of Pete's burns. Now he knew that all he had seen had been real —somewhere—*sometime.*

Pete introduced the newcomers, including Delsa, who was his wife. This unexpected knowledge gave the Grandins a start and a moment of unease. They searched the face of the woman for a moment's hope

that their previous estimate of her madness had been wrong. But her eyes were still upon Jack, and there was eagerness, and an unnatural hope burning there.

The two men were Dr. Bradburn, and Carl Simons, an assistant physicist who had helped Pete in his electronic work.

There was a moment's stilted acknowledgment of introductions and embarrassing memories.

Delsa said, "It's my fault they came back, Pete. But I was so sure . . . and when I thought of him escaping—"

Pete silenced her with a touch of his hand. "It's all right now, darling. They understand now. I'm sure you do, don't you?" He addressed Grandin and Marcia. "You know the shock you experienced merely passing into that dead city. Perhaps you can understand the shock that my wife—all of us—have known by living through those events and that environment."

Grandin nodded absently. His mind hadn't been thinking of those things. It had leaped ahead to the inevitable conclusions of Pete's

story and the concrete evidence of the appearance of these people.

With man's doom so calculable, his purposeless existence had become purposeful and reasonable. There was a goal worthy of all the energies he had so fruitlessly wasted in the eddies and coves of science. All he had done up to now had contributed to the certainty of man's annihilation. To attempt to swerve man's course leading to that futile destiny would be his work from now on.

These were the thoughts that he expressed when they were gathered that evening in the living quarters Pete had erected in part of the garage building.

Dr. Bradburn nodded approvingly. "None of us who have survived the explosions have more than a year to a year and a half to live. Pete has less than any of us. The best he can hope for is to pass his dream into hands that may be able to carry on the work. That is why he has searched so hard for someone who could understand and complete it."

Marcia said, "I'm terribly sorry we misunderstood you and ran away. But it was such a shock. We were not ready to accept anything as friendly in the forbidding scene—especially after that man tried to steal our gas. But what did you mean, Delsa, when you kept speaking of Jack with such emphasis?"

For a moment Delsa's eyes reflected panic. She glanced at Pete, but he seemed not to have heard.

"It was nothing," she said hastily. "Just a fantastic notion that Jack was a certain someone Pete had hoped to find. You'll have to forgive my actions, for the shock of our experiences has been almost too much for me."

As if suddenly coming alive out of a deep trance, Pete began to speak. His eyes were far seeing and staring. "Fear," he said, "only fear will control man's insatiable lusts. We haven't come very far up the evolutionary ladder. Not nearly as far as we've supposed. But man is not so bad that he doesn't deserve a chance to prove what he can do. Only fear can prevent his self-destruction before he ever has that chance. Let every man and woman see the ruin and horror to come. Let it burn in the brain of every magistrate and governor of states and nations. Let it haunt the dreams of every minister of state. Only then will men and their rulers begin to work for eternal peace. Only then will they learn that men and not things are of chief importance to man. And perhaps it is a forlorn hope, after all—"

To Jack, listening to this talk of the destiny of man and nations, it seemed as if swift years had passed since dawn. He felt raised to man's estate to have heard such words and seen such sights as had been his in the last two days.

But it seemed more than a brain scarcely into adolescence could endure. He'd foreseen a life for himself filled with the excitement of discovery and a thousand skills

and inventions of his own hands—but without purpose. Now there was a purpose, foreordained and inevitable, for he knew that his mission was aligned with that of his father for as long as he should live.

When the talk lulled he found his way out into the darkness under the desert stars, and he stood watching them. How long he had been there he did not know when he heard the sound of a footstep.

He whirled. He recognized the shambling steps of Pete. His first impulse was of fear, for the physical form of the scientist was fearful in the night by the light of the stars and the cloud-swept moon.

"Jack—?" Pete's voice was hesitant.

"Yes?"

"Will you sit down with me—here on the ground?"

Without waiting for answer, Pete slumped to a sitting position with his back against the side of the garage which was filled with his sign. Jack came down beside him.

" 'Pete Can Fix It.' Remember those signs along the highway?"

"Yes," said Jack. "We followed them all the way from Wickenburg. We wondered who this Pete was."

"I've often wondered, too. You see, when I was a boy just about your age I came along this highway with my parents. We were going on a vacation somewhere, but all I remember is that string of signs, Pete Can Fix It. That's the only thing I have left of the world before the bombs came. Just that and my scientific knowledge and skill. After the bombing I never knew who I was, not even my name. I remembered no friends or anything that I had been—only that crazy sign, Pete Can Fix It, and those few long ago days when I came down this highway as a boy. But even the faces of the parents who brought me along here are gone from me.

"I came back to this abandoned garage. I thought it might help bring back the memories—and help find someone I once knew.

"Tell me about yourself, Jack. The things you've done, the things you hope to do."

"Nothing much has happened to me," said Jack. "I've never known what I really wanted to do—until now. I went to school at Meredith. That's near Elkins, but I guess you wouldn't know about that. We have a place there where I can have a horse. He's called Baldy, and we're good pals, but he was kind of wild at first."

Pete's voice caught. "And he threw you—"

"Yeah, when I first got him Pop warned me not to ride him until I'd had some training and Baldy had grown used to me. But I was so anxious that I got him out one day and rode him anyway. He threw me and my foot caught in a stirrup. He dragged me a long ways before it jerked loose, carried me over some barbed wire in the field and ripped my chest."

"Yes," Pete whispered suddenly, fiercely, his eyes on the stars overhead. "And you struggled to the

house and tried to tell the folks that you fell off the barn because you thought they'd take the horse away from you."

"That's right—but how did you know?" Jack turned and looked into Pete's eyes in a moment's fear.

"I remember now—all of it. Baldy, the old barn and the porch steps that creaked— Look!"

Pete suddenly opened his shirt, and the moon soared into full brilliance with a sudden crescendo of light that struck the jagged, livid scar that ran across his chest. Jack stared at it a moment, then gasped in horror. He recognized the fish hook shape in the center of his chest.

"You went up to your room alone and prayed that night that Baldy wouldn't be taken away—"

"Don't!" Jack cried out.

"Don't be afraid," said Pete softly. "You see why I came back to this road, now, why I had to find you. You have to know and understand. No one else can carry on my work as you can. Not even —your father. Within two or three months I'll be utterly useless. In a year I'll be dead. Learn from . . . your father . . . learn all the science and technique that you can cram into your head. Develop the skill of your hands. Fear—fill the whole Earth with fear—fear of man's own evil. Maybe I haven't got the answer. Maybe there is no answer. But do your best. I've tried to do mine."

Mercifully, the moon's light was hidden for an instant while Jack's eyes fought back the stinging, and his young spirit wrestled with the sudden weight that was hardly bearable to it.

Then, after a moment, he said quietly, "I'll do the best I can."

There was a step around the edge of the building and they recognized the silhouette of Grandin.

"Let's . . . just not tell them, shall we?" said Pete. "It will be easier on . . . your father and mother if they don't know." He glanced down at the repulsive flesh that was himself.

In the darkness Jack swallowed hard and choked back the surging in his throat. He extended a hand. "Yeah, that's best. We won't tell 'em."

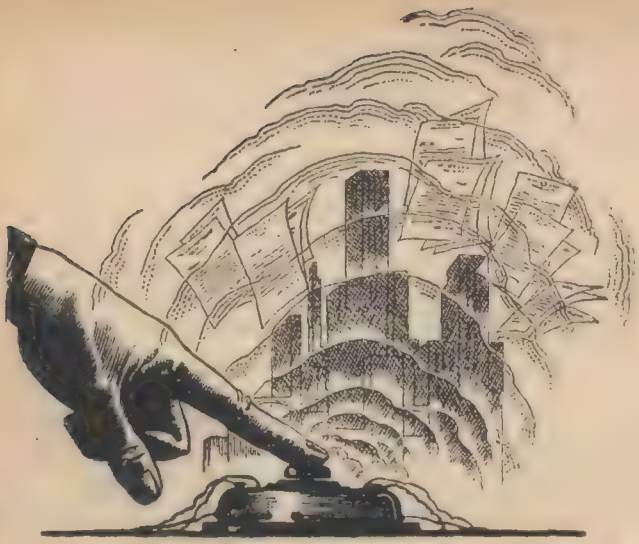
Slowly Pete moved away to enter the building. Grandin came up. "We wondered what had happened to you, Jack. What were you doing out here?"

"Pete and I were just talking. I'm ready to come in now."

As they moved away from the wall, Jack glanced back at the enormous letters: Pete's. And at the smaller, defiant boast: Pete Can Fix It.

"You know," Jack said suddenly. His voice became steady and confident as he stepped forward to match his father's stride. "You know, somehow I think that maybe Pete *can* fix it."

THE END.



THE ANSWER

***The** dictator didn't give advice; he gave orders. The United Nations didn't give orders—just advice. Reams and reams and reams of it. But the advice had a way of making itself felt.*

Illustrated by Orban

—BY GEORGE O. SMITH

Robert Hohmann smiled superciliously at the man before him. "You have nerve," he said. It might have been a compliment excepting that the tone of the words was definitely sarcastic. "You have the colossal effrontery to come here before me and tell me what I can do and what I cannot do."

Greg Hammond said, quietly, "Shall I repeat it? You are not to attempt the construction of the plutonium producing uranium pile."

"Or else—what?" sneered Hohmann.

"The United Nations makes no threats," said Greg. "We are not a military- organization. We are the voice of the people—including yours, Hohmann. We merely set forth that which the people desire, and remind them of it. If someone —you in this case—goes against the

will of the people, it will be for the people to decide his fate."

"You do not understand," said Hohmann, "nor can I possibly penetrate your illogic reasoning. The person is secondary to the State. Therefore it is for the State to—"

"The State is the result of the people," returned the United Nations representative. "Were it not for the people, there could be no State."

"Were it not for the State," thundered Hohmann in a ringing voice, "people could not exist in the luxury they have. Man would still be pitted against man and brother against brother. The State combines them into an insoluble unit."

"The United Nations combines all States into an insoluble unit," replied Hammond.

"Which believes itself capable of telling me what I can and cannot do!"

"You, as dictator, find little trouble in telling your subjects just how and what to do. You back up your demands with threats of death."

Hohmann smiled contentedly. "So, my bright young friend, you must admit that your United Nations organization is no different than Robert Hohmann, dictator. I issue orders which may conflict with the desires of some of my people. You issue orders which occasionally conflict with some of the desires of your States. Mine in this case."

"We issue orders only when the desires of a State are directed against the common cause," said Hammond.

"A common cause decided by people other than those who will benefit from my act," snapped Hohmann.

"This gets us nowhere," said Hammond with an air of finality. "You are, therefore, directed to cease in your plan to construct the p l u t o n i u m producing uranium pile."

"The trouble with democratic organizations," said Hohmann sourly, "is that they will go to any lengths to preserve their people. Even to the point of permitting, under democratic principle, the existence of an organization directed against the democracy itself. This, they claim, shows the true strength of democracy, since if it stands even when permitting an outfit to bore from within against it, it is therefore strong. A single man is worth more than the seat of government! Ha! Well, we shall start our uranium pile, and we shall produce plutonium. And by the time your democratic organization gets through arguing, voting, and deciding what to do about us—then preparing for it—and finally acting, we can and will be unbeatable. As for you, who have the temerity to come here with your toothless demand, you shall be hostage, a worker willing or unwilling in the initial plutonium separation plant!" H o h m a n n turned to the guards and said: "Remove him!"

Greg Hammond was led from the

large hall amid the jeers of Hohmann's cohorts. As he left, a discussion started upon the construction of the illegal uranium pile.

Hammond went quietly. He knew that he had the backing of the world, and the world would not let him down. He was convinced that Hohmann's remark was right. Greg Hammond was more valuable than government itself—and government would not let him die.

Hohmann was no fool. The dictator knew that he was bucking the combined resources of the world, and it worried him somewhat, even though he put up a brave front and daily told his people that the United Nations would not act against him.

The espionage that went on reported that little was being done. Hohmann trebled the external espionage, and multiplied the internal agencies tenfold. He was taking no chances. Materials shipped into his country were followed to the addressee, who was then investigated. Every mail carrier and delivery boy was a member of Hohmann's Intelligence Group. Shipments of manufactured articles were stopped or diverted; Hohmann knew that the plating on a cigar lighter might contain fissionable material.

But there were no moves on the part of the United Nations that Hohmann's Intelligence Group could detect.

And it was the lack of action—even lack of anything other than denunciation—that worried him into calling a Security Meeting.

His hall filled to overflowing with higher-ups, Robert Hohmann faced them and said:

"We are here because of a singular lack of activity on the part of those who have reason to fear us. Reprisals may come in many ways, some of them must be new and terrible, even though they are now undetectable. The problem of the pushbutton war is known to all—why drop bombs when bombs may be shipped in among the incoming merchandise, assembled in a tall tower, and touched off by radio. We, therefore, must locate the manner of the reprisals."

Worried faces nodded.

"This is no war of nerves," thundered Hohmann. "It is possible to cause mental confusion in someone by merely ignoring his overt act—he eventually spends more time worrying about what you intend to do about it than he does in preparation. This will not work. Admittedly we have multiplied our Intelligence Group in an effort along this same reasoning. The lack of action on the part of the United Nations has caused some concern. But we are not an individual, and we can divert a carefully calculated number of workers to investigate while the rest of us can prepare for war. The problem, again I must admit, has achieved a rather overrated proportion, hence this meeting."

Professor Haldrick looked up at Hohmann and said, quietly, "In other words, Führer Hohmann,

even though you state that the so-called war of nerves cannot succeed, we are meeting to solve that very problem?"

Hohmann hissed at Haldrick and snarled for the professor to be quiet.

"Now," said Hohmann, "what has been occurring lately that might possibly be construed as being out of the line of ordinary happenings?"

General Friedrice shrugged. "I must admit that the mail has increased markedly since Hammond's incarceration. Letters pour in from all over the world to this government bureau and that government agency. They plead, they cajole, and they call names."

"I can imagine your fear at being called names," laughed Hohmann.

"Indeed, we are cringing abjectly," replied General Friedrice, who would have had to reduce his figure by at least seventy pounds before he could possibly cringe without hurting himself. "We find ourselves in a rather strange circumstance, however. These letters are, of course, saved. This makes for too much paper work."

"We can take care of that," said Hohmann idly.

"I know. But that is the only thing I know of," said Friedrice.

"Enough," said Hohmann. "This is another example of the confusion-method. Our enemies hope to worry us by doing nothing—which is expected to make us fear something ultra-secret. Well, to a certain extent they have worried us. Not to any dangerous point, however, for we are too strong to be defeated by a mental condition. This overbearing arrival of letters is another thing. All letters must be opened and read, for some of them do contain much valuable information. They must all be saved and filed, for unless we have previous letters from some correspondent, we cannot know by comparison, whether a future letter containing information is false or true. A letter giving information that comes from a known correspondent who is helpful in the past will be treated with more respect than the same information coming from someone who has written reams of misdirection, falsity, and ranting notes depicting dire results if we do not release Hammond and behave ourselves."

Hohmann shrugged.

"Even so, we cannot be shunted aside," he added. "We have plenty of people who can take care of the misdirection, just to see that something isn't happening to us. The rest of us can continue preparing. Which brings me to another point."

Hohman paused dramatically.

"When I press this key," he said, indicating the diamond-studded telegraph-style key, "the uranium pile will start to go. The key is connected to the restrainer-rod controls of the pile; when pressed, the rods leave the pre-set positions of no-reaction and fall under the automatic controlling circuits. The pile will then start functioning at approximately ten kilowatts. After

checking, it will be advanced to a more productive power, and we are making the first step toward our glorious future."

A commotion started at the door, and everybody's head turned to see the guards bringing in Greg Hammond.

He shrugged off the guards and faced Hohmann defiantly.

"The United Nations have not stopped me," said Hohmann.

"The United Nations will never try to stop you," said Hammond quietly. "We can only advise. Whatever is done, whatever may be started, we only advise. You make your own future, Hohmann. Every man makes his own future. And up until he starts that which is forbidden, he may stop with no danger. Once your uranium pile is started, Dictator Hohmann, you cannot retrack."

"I am about to start it now." smiled Hohmann.

"I warn you again to stop and think. You are not violating our laws until you press that key, therefore we can initiate no punishment. Once the key is pressed and the uranium pile starts, you are a violator and subject to punishment."

Hohmann laughed uproariously. "This starting will be secret," he said. "Just as any starting may be secret. I, give me credit for it, gave warning otherwise we might have completed our pile of bombs and been ready to attack before your precious, toothless organization could act."

"We may not be toothless," said Hammond. "I ask you to consider, and once again warn you to desist. Building the pile is a misdemeanor. Producing plutonium is outlawed. The final analysis, Hohmann, is whether the plutonium is separated or not."

Hohmann laughed again. "You cavil," he told the United Nations representative. "First it was mere contemplation that was evil. Then the start was considered evil. Now we find that you think it dangerous but not evil until we start the pile. Next you tell us that we can start our pile providing we do not use the plutonium is produces. Each time you back up—like the average democracy. Your final step of course, is to protest vigorously while the bombs are exploding in your cities. Fool!"

He reached for the key.

"Stop," said Hammond. "It is dangerous."

"So is crossing any street," said Führer Hohmann.

He pressed the key vigorously, and a simultaneous flash went off, taking his picture for history. Somewhere in the country, well hidden and removed from danger to the populace, the control rods moved, and a flow of neutrons started to pass upward through the great pile of uranium and moderator.

The nerves of the men present twitched. Strain. Those who held fear of reprisals were half expecting something dire to happen simultaneously with the start of the pile. Those who had no fear felt the

surge of exultation as they took their first real step towards world domination.

It grew warm in the room, but nothing happened. Then as the first report came in that the uranium pile was working, Hohmann dismissed the audience with a grand promise for the future.

Führer Hohmann faced General Unger with fury. "You must be more careful!" exploded Hohmann.

"But I am careful," returned the general.

"Then why do I receive a letter that is radioactive?" demanded Hohmann angrily. "Feel it—it is warm!"

Unger felt the letter but felt nothing untoward. "I feel nothing," he said.

Hohmann opened a cabinet and removed a counter. He held the letter to it and the counter clicked in rapid succession.

"See?" stormed Hohmann. "Now, before you find yourself removed from public—and private—life, tell me how and why this must happen?"

"If it actually happened, it is an error, and some underling will be treated severely—"

"The head will be treated severely as a warning," shouted Hohmann. "Pass no buck, Unger. Your men are responsible to you—but you are equally responsible for them. Me—I think I will kill you myself! You might have deprived our people of a leader!"

Hohmann advanced toward the general, who faded back away from him. Across the vast office went the two of them, slowly and stalking, catlike. The general backed up, his face contorted with fear.

"Yesterday I start our pile," stormed Hohmann, "and this morning I get a radioactive letter! Twenty-four hours! Have you no shielding around that pile?" Hohmann grinned wolfishly. "Seems to me that I should lock you up in your own office over at the laboratory. Then you'd find that shielding is desirable, you idiot. Radiating like this—to render hot a letter, or pile of paper from which this letter came. Bah!"

He went forward again, and General Unger felt the dilemma he was in. He could not strike back; to kill this leader would bring about his own very slow and very painful death. To submit was death, but Hohmann was a good pistol shot and it would be quick. Yet to prolong life for another few precious moments, Unger retreated before the blazing eyes of his leader.

He backed, and felt the filing cabinets block his further retreat. He had crossed the vast office, backwards.

He pressed back against the cabinets and felt a warm wave of fear flush up through him. It rose and rose, and he pressed harder and harder back against the cabinets—

His yell of pain shattered the air. Hohmann startled, and the pistol went off with a loud racket. It missed, but General Unger was facing away from him, looking at the cabinets and rubbing his elbow.

Tentatively, Unger reached forward and touched a finger to the handle of the nearest file drawer.

He jerked it back, and blew upon it.

"Hohmann," he said. "They're hot!"

"Hot you idiot?" screamed Hohmann. He wet his forefinger and touched the metal of the drawer. There was a faint sizzle and Hohmann jerked his hand back too.

"Fire!" he yelled, racing for an extinguisher. With a hook, he hurled the drawer open and hit it with the spray. It exploded into a cloud, a cloud that choked them and sent them from the room in a hurry. Hot carbon tetrachloride vapor is not attractive.

Men piled into the room, followed shortly by the official palace firemen. Shortly the head man emerged.

"Führer," he said apologetically, "the cabinets are hot, but there has been no fire."

"No fire? Then how—"

The alarm rang again, and they raced to the office of General Friedrice, who was standing outside with a look of fear on his face.

"The file cabinets?" asked Hohmann.

The general nodded dumbly.

"Fire?"

"No—just hot."

"But there must be some reason—?"

General Unger looked up nervously. "Radioactivity?" he said.

"But to collect that much radioactivity," said Hohmann, "would take time. And why was it not noticed sooner?"

"That I do not know."

"Come—we'll read the Intelligence News Report," said Hohmann, leaving on a dead run.

He had the tape in his hand as they came up with him; they listened to his voice read the words from the tape.

". . . mail carriers resign as mailboxes are hot to touch. Minor fire in business offices of Greggham & Son, no damage done. Fire departments in all cities are rushed to danger points. Conference called to discuss the outbreak of spontaneous fires in government offices. Professor Haldrick claims all fires not dangerous—"

Hohmann turned to Unger. "You're the head of Nuclear Physics," he stormed. "I want a complete report in twenty-four hours!"

The hours passed. The fires grew. No longer were they merely hotboxes, but in some important cases open flames broke out and consumed the paper. The charred ash continued to be too hot to the touch, and there was panic in the country.

Unger came at last. Dejected and pale with fear.

"Well," stormed Hohmann, "what is it?"

"I'm not certain other than its effect," said Unger shakily. "All paper is artifically radioactive, and it heats up when the radioelements approach the critical mass—"

"Get Hammond!" screamed the dictator.

The United Nations representa-

tive was brought. He came with a smile.

"What is this?" stormed Hohmann.

"Your own decision," replied the representative. "You should not have started the pile."

"Go on," gritted Hohmann.

Greg Hammond smiled. "Plutonium has a characteristics radiation that we do not quite understand," he explained. "However, this radiation will cause fission in certain types of medium-long lived radioelements. The range of the plutonium radiation is unknown, but it is great enough to bathe the entire country. You will find that most government offices are bulging with reams and reams of correspondence, many of which are over the critical mass. Nothing happens until someone turns on a plutonium-producing uranium pile, lets it run for a few hours, and the accumulation of plutonium starts. Right now, Hohmann, you have about four hours before most of your government offices go sky-high—from their own red tape." Greg Hammond smiled. "The United Nations only advises," he said. "And many millions of letters of advice arrived, all written on radioelemental paper. Had you taken that advice, the paper would have been innocuous inside of about thirty or forty years. You did not. Now you have lost completely, Hohmann, for the radiation from that paper when bombarded with the plutonium radiation, produces a whole string of secondary radioelements in your offices, in your desks, in your bodies, and in your air. The ash from burning is still hot, Hohmann, and the trucks that will carry the deadly papef will be as deadly. Your very country will be subject to slow fission if you start another uranium pile for several hundred years. I'd advise you to stop the one that is now running, Hohmann."

"I'll let the world go up with me," screamed the dictator.

"That it will not do," said Hammond. "You see, if you do not shut it off by yourself, we'll all be dead in an hour, after which my cohorts can locate the pile with neither difficulty nor interference. Make your choice, dictator. And remember, the United Nations only advises, never demands. Our advice, however, may be said to be written with letters of fire."

THE END.

THE ATOMIC STORY

Due out in January, "The Atomic Story," by John W. Campbell, Jr. is a complete discussion of the history of nuclear physics, past—beginning with Democritus—present—through the Manhattan Project—and probable future. In essence a full scale expansion of the material, and the background, of the articles and editorials of Astounding Science Fiction, it is intended to make the Smyth Report and the Lilienthal Report clear to readers who do not have a background of nuclear physics.

Published by Henry Holt & Co., it is available from the publishers or at your local bookstores.

BRASS TACKS

Natlane gave it up as a bad job, too.

Dear John:

September ASF:

1. "Evidence." Lovely! The best of Asimov's robot stories, including even the memorable LIAR!

2. "Vintage Season." Beautifully written, but the surprise ending—the coming of the Blue Death—didn't seem to add much.

3. "Blind Time." Neat.

4. "The Toymaker." But it seems that a story which deals with the causes of war, as this one apparently attempts to, should do a more thorough job of it.

5. "Slaves of the Lamp." The only poor story in this exceptionally good issue, and my reason for writing this letter.

The thing I disliked about Zagat's serial was Natlane's scheme to "save the world in his own way." Let me summarize it. Natlane proposed a new race whose members would always act in accordance with "Reason" because they would be immune to environmental influences. This immunity would be built up by subjecting the individuals to diverse stimuli, with the purpose, one gathers, of numbing them until they could not react to anything. By this process Natlane hoped to create a population of ultra-rational zombies incapable of emotion.

I, not being immune to outside stimuli, have a very low tolerance for nonsense, and cannot restrain my impatience with Natlane's ideology. What is life but a continual series of reactions and adaptations to environment? We find a new situation, we meet it. I've met a great many people of varying degrees of rationality; the more rational people reacted to their environments in more satisfactory ways—their emotions were channeled by reason into more correct ultimate actions—but all reacted. Natlane's superzombies, on the other hand, would be so conditioned to invulnerability that they wouldn't act at all, let alone act rationally.

The ultimate ideal of Natlane would seem to be death! And, as a matter of unpleasant fact, this might very well be the result of dosing human embryos heavily with cosmic rays and alpha particles.—Chan Davis.

Ouch!—Art Dept.

Dear John:

Your September 1946 issue brings out several thoughts.

(1) p. 97, F. Nash letter. In my previous letter (ASF, May '46, p. 94), I capitalized "International Phonetic," meaning *The* International Phonetic Alphabet, with which, as a longtime member of the Association Phonétique International, I'm naturally familiar. If Mr. Nash wants to see it, let him consult the Cassell bilingual dictionaries or the pronouncing dictionaries of Kenyon & Knott; Jones; Palmer, Martin & Blandford, et cetera.

(2) p. 94, article by D. Edwards. Good general idea, except that it was tried about fifty years ago—my own grandfather was an officer of the Simplified Spelling League—and had but limited success. Also, the author hasn't gotten around the fundamental difficulty of spelling a 35 (±) phoneme language with a 26-letter alphabet. Hence his final paragraph, which presumably shows the finished product, uses (s) and (g) in two senses each, (u) in four senses, et cetera.

(3) p. 100, article by W. B. de Graeff. The author displays that sublime ignorance of and naiveté toward political matters which has characterized many of the outbursts of the Los Alamos scientists. The basic question is, of course, the USSR, Communism, and world revolution. I suggest that Mr. de Graeff do some boning up on Marx, Lenin, and the other Communist saints before recommending any drastic gestures of unilateral disarmament and self-abnegation on the part of this country.

Moreover the author has, I think, grossly libelled and misrepresented Communism and its adherents; if I were they I'd be sore. He assumes, by implication, that they are spineless sentimentalists who are influenced by such emotions as "confidence" and "mutual respect," or hypocritical bourgeois moralists who would be deterred from promoting the world revolution by such silly considerations as honesty, or weakling humanitarianists who would abandon their sacred aims for fear of killing half the world's population. In recent months they have told us, by speeches of the leaders of the USSR and articles in their press, that while they'd like us to do the things de Graeff recommends, they aren't asking for secrets, and wouldn't make any concessions to us in return therefore; that they intend to have their own bombs, and will not agree to inspection or to any other measure that would restrict their rights to do as they please; and that the only form of super-state they would join is a world USSR. Draw your own

conclusions. If de Graeff still thinks that literally nothing is worth fighting an atomic war for, he ought to tell us to surrender now, for that may be the choice imposed on us. Of course, if we had a real world state, with directly elected legislature, and powers of taxation, conscription, and policing, et cetera—But we haven't, and while that's largely our own fault, we're confronted with a condition and not a theory.

De Graeff also reflects the violent hostility which scientists in general and the Los Alamos boys in particular developed towards the military, in his comments of the May-Johnson Bill. This is natural, since the average military organization is designed to drive most scientists crazy if they get caught in it; but it's still emotional and not reasonable. Since the task of a military organization—destruction—is practically the opposite of that of science, it's inevitable that such an outfit should differ violently from the scientific ideal. If they weren't that way they wouldn't work.

(4) *Pros theón,* what have you done with your pictures? They're awful!—L. Sprague de Camp.

———

Where to find the answers in detail.

Dear Mr. Campbell:

Your friend Jerry Shelton and evidently his friends too are suffering from nothing more than ignorance of the existence of standard texts published for both the Army and Navy on gunnery and ballistics.

I know that any Navy Gunnery officer can find an exceptionally complete answer to Mr. Shelton's first question in Hermann's *Exterior Ballistics, 1935,* U. S. Naval Institute.

The Army men could find an equally scientific explanation in Hayes' Elements of Ordnance. Why don't your artillery pals brush up professionally, Jerry?

Question 2 is more troublesome because projectile behavior with rifled guns is extremely erratic at such high elevations, due to excessive drift, wind effects, effect of Earth's rotation, and other factors. Those extreme trajectories are so erratic that effective firing at elevations such as 85° relative to the *horizontal* with rifled guns—not mortars—is not feasible.

Question 3, as phrased, is meaningless. However, if Mr. Shelton refers to the fact that up to a certain range both a high- and a low-angle trajectory will pass through a given point, then the answer is that A. A. ballistic charts and computers are arranged to select the low-angle trajectory because of its shorter time of flight.

Question 4 is answered in the publications mentioned, to which all those *seriously* interested in gunnery and ballistics are respectively referred. They are not restricted.

I don't know how that fly got in here but I believe that recent high-speed photographs of a fly landing on a glass plate reveal a half roll. Personally, I think that this is the fly's own business, and

now that he has been investigated, I hope he practices on the half loop just to thwart people who worry about such tripe.—C. E. Tripp, R. D. #2, Hudson, Ohio.

Well, if the NACA is sure of it—

Dear Mr. Campbell:

Just finished the "Brass Tacks" section of the September issue of Astounding Science Fiction. I was amused by Jerry Shelton's two simple questions, and would like to answer them for him.

First his question about the shell. To begin with the answer is proved by aerodynamics and therefore his statement, "Air pressure has tendency to push nose up on airfoil principle," must be declared false—to be proved later. The nose of a shell *does* always point along the shell's trajectory because the base of the shell with its larger diameter has more drag aerodynamically than the nose and must therefore follow the nose due to the "weather-cocking tendency" which is evident in *any* object entered into a moving air stream. A good demonstration is to drop a conical paper drinking cup. Due to its conical shape the cup—as the shell—is aerodynamically stable and will always fall apex in the direction of motion. In section #2 of Jerry's first question, he asks whether a shell fired nearly vertically reaches its highest and then turns around to come back down. The answer, of course, is yes. When the upward momentum of the shell is overcome by gravity, it begins to fall. As it falls, the air starts rushing past it—and it weather-cocks.

His question about the fly is one that was going the rounds of Pensacola when I was a Cadet there in 1942. Someone finally wrote to N.A.C.A.—National Advisory Committee on Aeronautics. The answer we got from that undisputed authority was that the fly in getting on the ceiling, neither half loops nor half rolls but flies up close, sticks his two front feet above his head, fastens them to the ceiling, and then momentum swings the fly's other four suction-cupped-feet in contact. There he is tight on the ceiling and definitely upside-down.

About the nose of the shell tending to rise due to air pressure working on it as an airfoil—ha ha. Jerry either forgot or doesn't know that the "angle of attack" of a shell is—Zero—C. H. Masters, Flight Instructor, Knipp Aviation School, Pimlico Airport, Baltimore, Maryland.

The scientists appear to have a better answer to the fly problem; on the stiff-neck problem, I don't know.

Dear Sir:

One of Mr. Shelton's deep problems was, I quote, "When a fly lands on the ceiling upside down—does he do a half loop to land—or a half roll?" A *very* grave problem!

I took his challenge. I thought, I mounted a table, and I observed. As a reward for a sore neck and a

tired back, I have found the answer. A fly will almost invariably do a half-roll to land on the ceiling. I say "almost" because a few of them did half-loops but I think they were just showing off.

If any learned scientist cares dispute my findings, I personally challenge him to disprove them. I am told rest and liniment is the best cure.

An interesting side light on flies is their method of orientation. On each side behind the wings they have a small pendulum gyroscope similar to an apple stuck on a stick. These gyroscopes vibrate, when in flight, perpendicularly to the fly's body. The axis of vibration will resist any change of direction, hence acting upon the nerves and giving the fly a sense of direction.

This effect may be observed by mounting a stiff wire in a piece of flat board. Bend the wire and release it so it will vibrate and turn the board. The wire will continue to vibrate in the same direction.

Since this is aside from the original problem, I will delve no further into the intricacies of a fly's anatomy. I have my own theories on how a shell knows which end is up but that would start a never ending argument.—Roger B. Odom, 3016 S.E. 55th Avenue, Portland, Oregon.

Iu will hav difikulti wic rejunul aksenz if iu tri for a iunifid speliq.

Dear Mr. Campbell:

"Meihem in ce Klasrum" is as clever and as interesting an article as I have read in *Astounding Science-Fiction* for a month or two. But Edwards must have written it in a terrible hurry, for that last paragraph is mayhem and no mistake. There are at least ten errors in spelling, following Mr. Edwards' own rules. As a matter of fact, there may even be an error in the title.

Look over this and compare it with the last paragraph as Edwards wrote it:

"Kontinuing cis proses, iear after iear, wi wud eventuali have a riali sensibl riten languag. Bai 1975, wi ventyur tu sei, cer wud bi no mor uv ciz teribli trublsum difikultis, wic no tu leters usd tu indikeit ci seim nois, and laikwais no tu noises riten wic ci seim leter. Ivn Mr. Yaw, wi biliv, wud bi hapi in ci noleg cat his drims fainali keim tru."

The mistake of spelling "year" in the old style is a glaring one, but no less obvious is the "would" and "wud," the "we" and "wi," and the "be" and "bi." Meik up iur maind, Mr. Edwards.

Incidentally, there was no mention of the probable elimination of the "Q." May I suggest that it be used to denote the "ng" sound. Raitiq cud bi yortnd ivn furcr bai duiq cis.—Charles R. Tanner, 2007E Sutter Avenue, Cincinnati, Ohio.

Trouble is, to bridge the gap till we have such a world citizenry!

Dear Mr. Campbell:

For the Analytical Lab:

(1) "Vintage Season" — More fantasy than science-fiction, but good.
(2) "Evidence" — Asimov's always good.
(3) Tied: "Blind Time"—Confusing but interesting.
"The Toymaker" — Well written.
(4) "Slaves of the Lamp"—A good basic idea, but spoiled by too much thud and blunder.

Articles and editorial were, as usual, excellent. One thing: I don't agree that the atomic bomb makes all nations equal. Rather, it widens the gap between great and small nations. A little country hasn't the manpower and resources to set up the huge plants required for preparing and separating isotopes as described in the Smyth report. IF some revolutionary process using simple equipment and easily obtainable materials were found and made known to everybody, so that every nation had its atomic rockets, it would still be fatal to be small. For instance, Russia could lose a dozen cities and survive as a nation, because it has enough factories, depots, et cetera, scattered over an area too huge for saturation. But Denmark need only lose Copenhagen to be completely knocked out. A small country couldn't hide its rocket bases; any spy service—beg pardon, Intelligence Service—could check its tiny area, while it would take an invading army to check all of Russia, the British Empire, the United States of America, or any other large country powerful enough not to be overrun with foreign agents.

I'd say bacteriological warfare is much more of an equalizer, since it takes no huge conspicuous installations to prepare new bacterial and virus strains, they can be smuggled into another country much more easily than radioactive atom-juice, and the large population and quick transportation network of a great industrial nation would, if anything, spread an epidemic more surely than in a small agricultural country. How about an article on germ warfare by somebody like Willy Ley?

The eventual solution, to my mind, is government by experts in psychology—including, in its broadest sense, economics and indeed every field of human behavior and relationships. Everyone who desired public office would have to train for it, probably through socialized education. We don't let untrained men build our bridges or remove our appendixes, so why let them make our laws? Appointments would be on a strict merit basis, including tests of altruism, tolerance, and similar qualities. This would be a world government, at least in that it had all important sovereignty; war would be absolutely forbidden, including trade and other wars acting against the public interest. A fairly small world army would be sufficient to enforce this, if it had a monopoly of weapons, and inspection powers as outlined in the Acheson-Lilienthal report.

To prevent this system from degenerating to a bureaucratic tyranny, there would be the usual free-

doms of expression and assembly, with the important addition that everybody be thoroughly trained in psychology—broad sense—and especially semantics. This would prevent those wars of psychology you fear, as a person so trained would be unshakably independent mentally, immune to rabble-rousing and other means of fostering delusion. A nation of such alert, intelligent citizens, or even a fair-sized minority of them, would be quick to spot any attempt to set up a dictatorship, and act to prevent it. (As in "World of Ā," a really splendid story which didn't get the appreciation it deserved because a reading of Korzybski is almost a prerequisite.)

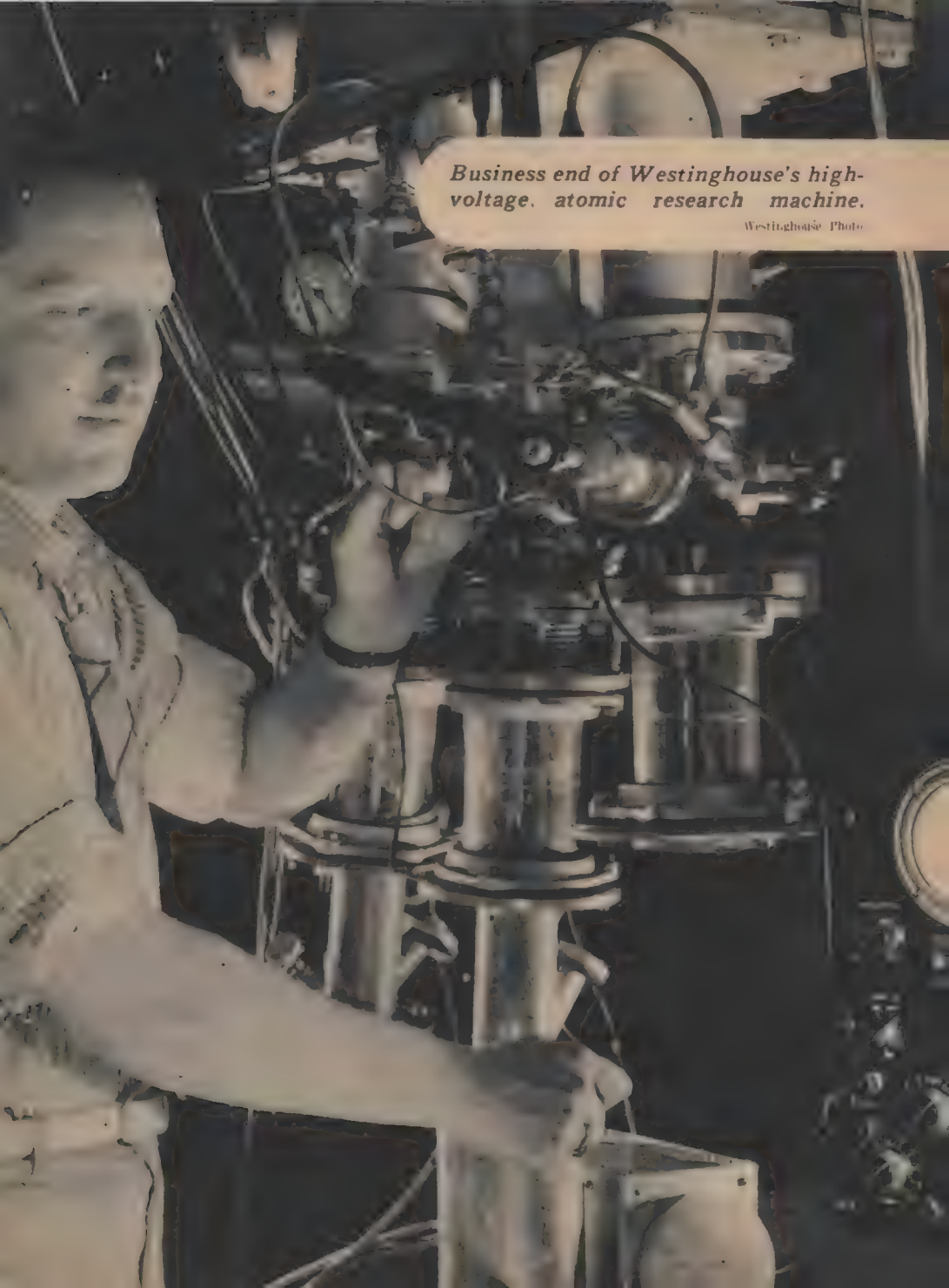
This is, of course, very sketchy, somewhat idealized, but one could write many volumes without covering all the ground. In any case, it represents a limiting condition which we will approach slowly if at all. The transition to scientific world management is going on right now and, since unintegrated humans hate and fear change, it is as violent as all such transitions. We'll have to settle for some stopgap arrangement preventing a shooting war, and then approach the ideal gradually, introducing more and more specialists into government, and science into education. Dictators and many politicians will resist the trend, as will the general conservative mass of man, but if we can only prevent the disaster of another war the scientific method will almost inevitably come to be dominant in time. I subscribe to no "personal devil" theory of history, even politicians and generals are human; I think the root of all our troubles in all history beyond natural catastrophes is our inability or downright refusal to think straight, or in many cases to think at all. Man is an animal specializing in brains, and if he doesn't use them he comes to as much grief as a bird which refuses to fly.—Paul Anderson, Rt. 1, Box 32-A, Randolph, Minnesota.

"Some like it hot, some like it cold!"

Gentlemen:

Just a note to tell you how pleased I was with W. B. deGraeff's article "Congress Is Too Busy" in the September Astounding. It was a thoroughly sane discussion of the situation. You are to be congratulated on its appearance.

As to the stories: "Vintage Season," by Lawrence O'Donnell, was literate and interesting—far above the usual run. I was pleased. "The Toymaker" was another fairy tale on how to end war. But—please, do we still have to wade through such childish drivel as Zagat's "Slaves of the Lamp"? Come, now. —Lester Anderson.



Business end of Westinghouse's high-voltage, atomic research machine.

Westinghouse Photo

ATOMIC POWER PLANT

BY JOHN W. CAMPBELL, JR.

A discussion of the general nature and possible products —and by-products—of a commercial atomic power plant.

The first commercial atomic power plant was established in Hanford, Washington, during the war. It was extremely inefficient, since most of the energy produced was wasted away in the cooling water—a by-product of great potential commercial value. The atomic power produced at Hanford's three great atomic piles was used for a special job; the transmutation of U-238 into plutonium. It was a proper industrial use of atomic energy, the application of the atomic energy to a job that could only be handled by atomic energy. Many coal-steam-electric plants are operated solely to produce a chemical change—say aluminum or magnesium from their salts, or chlorine from brine. In these electrochemical plants, heat is produced as a by-product, and is wasted away just as the heat produced at the Hanford piles in the course of plutonium production was wasted into the Columbia River.

Properly, what we are most interested in today is not simply the production and use of atomic power; Hanford has that. We want an atomic power plant that efficiently uses all the by-products of atomic operation. It's worth considering, before we start discussion of such a plant, just what products-by-products there might be.

In any given industry, certain things are called "products" and others are termed "by-products." But which is which will depend on a lot of things having little to do with the actual materials themselves. Carbon dioxide is a by-product of the combustion of coal; dry ice is produced by burning coal, collecting, and freezing the carbon dioxide. Bromine is a by-product of salt production from natural brines—er,

Westinghouse Phot

Dr. Harvey Rentschler, director of Westinghouse Lamp Research looks at a piece of pure uranium metal. Westinghouse Lamp Research department accidentally became the No. 1 source of pure uranium. This piece of the metal, refined in 1922, was the world's first pure uranium; uranium was tested then as a possible lamp filament metal. To test it, Westinghouse had to find a way to produce a pure sample. It failed as a filament material, but Westinghouse continued to make it for universities and research institutes

that is, it was until the need for bromine in the production of high-octane gasoline forced the erection of bromine plants.

At Hanford, plutonium is the product, and enormous quantities of heat energy, radiation, atomic fission products, and radioactivated materials are waste products that are one hundred per cent headache. At Oak Ridge, now, heat energy is a waste product, but fission products, radioactivated materials, radiation and plutonium are products. Everything but the heat energy has found a ready "market."

If a plant is established in north-central Alaska, it will probably have, as its primary product, heat energy. Plutonium produced will be consumed as fuel, radioactivated materials and fission products will probably be recovered as by-products, and the radiation will be mainly a headache.

If the atomic-powered, unshielded jet-engine robot plane is built, heat-energy and radiation will be the products, with everything else wasted.

The radioactivated materials are beginning to find uses; at present, pure research is about all that is possible, because such small quantities are produced. But in the past, radium has been used as a source of gamma rays for examining castings, et cetera, for luminous paint, and radiation therapy. Radium lasts almost forever, in human terms—less than fifty per cent deterioration in a millennium. A radioisotope with a five-year life would be entirely satisfactory for many purposes; half-lives running up to ten thousand years are available. For luminous paints, shorter lives would do nicely. There will be a steady demand for such materials, and a smaller, equally steady demand for medicinal radioisotopes, using the activated elements to compound chemicals which will attack at specified points as needed.

The great diversity of possible products-by-products, and the relative values of those by-products, make it almost impossible to determine the economic status of atomic power plants vs chemical-fuel power. Our cover shows a possible atomic power plant installed as a turbine driving device for powering a city. Actually, it is probable that all atomic power plants, for the next fifty years, will be a strange and wonderful combination of commercial power installation, chemical processing plant, hospital clinic, and nuclear physics laboratory, the latter combined with a radiation chemistry laboratory. The hospital clinic will be allotted one side of the pile, the physicists and chemists another, the power plant engineers two sides, perhaps, and so on. The products of a pile are both real, tangible wealth and the real, intangible wealth of knowledge to be gained.

The type of pile used at Hanford is the basis for present experimentation in power-plant pile construction; a brief review of the basic theory of atomic piles is in order.

Uranium found in nature consists of the three natural isotopes U-234, U-235 and U-238. All three can be

fissioned by fast neutrons; the first *two*—not just U-235 alone—can be fissioned by slow-moving neutrons. U-234 is present in such infinitesimal amounts its presence can be ignored; U-238 constitutes a bit under one per cent, while more than ninety-nine per cent of the natural uranium is U-238.*

The problem faced by the Manhattan Project was, of course, how to separate a sufficient quantity of an isotope that would fission under conditions men could achieve. The problem was attacked in three principle ways: by the diffusion of gaseous uranium compounds through porous barriers, by electromagnetic separation of the isotopes in mass-production mass-spectrographs, and by the indirect method of synthesizing an artificial fissionable isotope, Plutonium-239, and subsequently extracting this new element chemically.

To accomplish this latter trick, atomic power plants were essential; only atomic energy on a wholesale scale is capable of wholesale atomic transmutation. Uranium fuel—natural uranium—was the only possible source of the necessary energy. But natural uranium will not undergo fission—self-sustaining fission reaction—under any conditions attainable. U-238 will fission—fission just as violently, and in the same self-sustaining way—as will U-235. But *only* when *high* speed neutrons are used. If a great mass of high-speed neutrons strikes a mass of U-238, the U-238 will undergo fission, and in turn produce even more high-speed neutrons, the essential conditions for a self-sustaining chain reaction. The only catch to this is that there is only one possible source of the necessary huge number of high-speed neutrons—an exploding mass of uranium! To explode U-238, or even to get it to react at all, you have to have exploding uranium—a completely circular, self-defeating proposition. It's in something of the position of a V-2—V-2 could make the trip from the Moon to the Earth—if it could only get to the Moon to start with. An academically interesting, but wholly futile fact.

U-235—and U-233 and U-234—differ from U-238 in that they will undergo fission, producing fast neutrons, when struck by *slow* neutrons. Slow neutrons have several enormous advantages: a neutron drifting along gently at the slow speed of a gas molecule at room temperature will hang around looking for trouble. The chances of its effective absorption are enormously greater. But even more important, a slow neutron will stay that way—it will keep on moving slowly for a long, long time, on the atomic scale. A fast neutron remains a fast neutron only for a very brief interval; if at first contact, it doesn't succeed,

* When the universe was new, U-235 formed a larger percentage of the total uranium in the world. U-235 has a half-life of about 2.5 billion years; U-238's half-life is 4.7 billion years. Starting with a ratio of 1 : 100, as time passes U-235 will decay away faster than U-238, so that a constantly decreasing *percentage* of U-235 will be present, as well as a constantly decreasing *amount*. Some 4 billion years hence, there will still be lots of uranium in the universe, but it will no longer be possible to build a natural-uranium pile. The *percentage* of U-235 will have fallen too low!

International News Photo

Hanford, Washington, where plutonium production is the project, counts heat-energy, radiation, and radioactive isotopes as industrial wastes—and headaches. Each could be a by-product, or a main product in a differently designed plant to make safety absolute.

the fast-neutron reaction won't happen at all. If at first the slow neutron doesn't succeed, it can, and will, try, try again until something does happen.

U-238 does not react at all with slow neutrons, moving at normal engineering temperature speeds—speeds corresponding to a few thousand degrees absolute; U-235 atoms do. But while U-235 atoms react readily and violently with neutrons of almost any speed from low temperature speeds way up to 100,000,000° speeds, U-238 will react with moderate speed neutrons to absorb them *without* fission. The reason is easy to understand in these terms:

All the superheavy element nuclei are overcrowded, and consequently more or less unstable. One symptom of this is the fact that ***no element heavier than bismuth has any permanently stable isotopes at all.*** That any of the superheavy elements beyond bismuth exists in nature at all is due to the fact that two of the superheavy elements do have very long-lived radioactive isotopes. Uranium and thorium are both radioactive in all their isotopes and

modifications, but thorium has one isotope—Th-232—with a half-life of 13,000,000,000 years, and Uranium-238 has a half-life of 4,700,000,000 years. The gradual disintegration of these superheavies maintains a constant small supply of the elements between uranium and bismuth in nature.

But among these superheavies, the instability varies greatly. Further, not only does their instability to spontaneous radioactivity vary, but their sensitivity to neutron-induced reactions varies widely, *but independently*.

Each of the nuclei requires a certain amount of excitation before its own natural, inherent instability will cause it to explode. A rock resting on the edge of a cliff is inherently unstable—a push that just gets it started over the edge will release the vastly greater energy of its fall. But it takes more of a push to get it started over if the rock is a bit further back from the edge.

To get U-238 started over the edge of fission requires 5.9 MEV—Million Electron Volts—of energy per atom. Once started, the U-238 atom responds with a release of about 200 MEV. *Anything* that supplies that 5.9 MEV of excitation energy to the nucleus of U-238 will cause nuclear fission. A 6,000,000 volt gamma or X ray will do it. Anything that can add that much energy to the *inside* of the nucleus. (Merely speeding up the nucleus *as a whole* won't do it.)

If a slowly moving neutron drifts into the nucleus of a U-238 atom, the mere addition of the particle will add energy to the nucleus. In the case of a slow neutron drifting into a U-238 nucleus, about 5.2 MEV is added. But since 5.9 is required to excite the U-238 nucleus to fission, a slowly moving neutron won't cause fission; instead, the nucleus readjusts by radioactive changes to Neptunium-239 and then Plutonium-239. But if a neutron moving with 0.8 MEV of kinetic energy strikes and enerts a U-238 nucleus, the total energy added will be the 5.2 MEV of the neutron alone, plus the 0.8 MEV of kinetic energy, or 6.0 MEV. Since that exceeds the critical excitation energy of the U-238 nucleus, the U-238 will fission.

U-235 differs in two things. It requires slightly less excitation to break apart in fission—5.2 MEV. And the simple addition of a slow neutron supplies 6.4 MEV of energy to a U-235 nucleus. The result is inevitable; no matter how slowly the neutron is moving, the U-235 nucleus will be overexcited, and will fission.

The approximate figures for the important nuclei of the superheavy elements are as follows:

Nucleus	Critical Excitation	Energy added by entrance of slow neutron
Thorium—Th-232	6.9 MEV	5.2 MEV
Uranium—U-234	5.0 MEV	5.4 MEV
Uranium—U-235	5.2 MEV	6.4 MEV
Uranium—U-238	5.9 MEV	5.2 MEV

The corresponding figures for two other important nuclei are not available; U-233 and Pu-239. Only the fact that, for these two, the neu-

tron addition energy exceeds the critical energy is published: both, like U-235, will fission with the slowest neutrons.

Since U-238, however, needs at least 0.7 MEV more excitation than is supplied by a neutron, the U-238 nucleus can accept a moderately fast neutron, become U-239, and hold together. Some readjustment to handle the added energy is necessary, however; the U-239 discharges an electron from the nucleus, becomes Neptunium-239, and is still a bit surcharged. A further emission of another electron, producing Plutonium-239 balances things off quite satisfactorily, and the nucleus simply settles down to a very mild radioactivity, with a half-life of some ten thousand years. Occasionally, a Pu-239 atom discharges an alpha particle—helium nucleus—as is characteristic of radioactive superheavy elements like radium and uranium; after this mild radioactive burst, the Pu-239 becomes a U-235 nucleus, and is stable for some 2.5 billion years.

Because of those energy relationships, U-235 will almost invariably fission * while U-238 will fission only if the incoming neutron carries more than 0.8 MEV additional energy as kinetic energy—hence the need for high-speed neutrons to produce U-238 fission.

For the atomic pile, three facts are vitally important: U-238 is in enormous excess—one hundred forty times as common as U-235. U-238 will absorb neutrons moving at any speed representing above about twenty-five electron volts of energy. U-235 will absorb—and fission—neutrons of any speed, including the slowest.

The problem of burning natural uranium as an atomic fuel, then, comes down to devising some method of getting the neutrons produced by fissioning atoms to react selectively with U-235 atoms present, and so maintain the chain reaction, instead of being lost from the chain in U-238, or in any other way. The Smyth Report shows there are four possible fates for a neutron in the atomic pile.

1. Fission reaction with U-235—the desired reaction.

2. Nonfission absorption in U-238.

3. Absorption in impurities present.

4. Escape from the scene of activity.

Items Three and Four can be controlled by chemical purification, and by making the scene of activity large enough to reduce the probability of escape without reaction. Sheer size will make escape improbable. Number Three can be used very simply to give desired control; mechanically introducing an impurity that absorbs the neutrons will damp the reaction and stop it.

A chain reaction we are all familiar with is the process of life and reproduction. In a nation, the fate of an individual can be expressed biologically as:

1. Natural death eventually after

* Even U-235 doesn't *always* fission when a neutron is added. It can occasionally hastily unload the dangerous excess of nuclear energy by discharging a very high-power gamma ray, and becoming a fairly stable U-236 nucleus.

International News Photo

Small survivor of Bikini, this mouse and his relatives in adjacent cages are being bred now for studies of mutations caused by bomb exposure. Results already show that the atomic radiations definitely did cause mutation. An atomic pile could be of immense aid in developing new, more valuable plant and animal species for agriculture.

successful reproduction.

2. Natural death without successful reproduction.

3. Accidental death due to non-biological mechanisms.

4. Emigration to some other nation.

If the rate of reproduction due to Reaction One exceeds the losses due to the three other reactions, the population will increase without limit. (And an atomic pile would explode.) But if the loss rate due to Reaction Three increases, without increase in Reaction One, at a certain level the population will become static, neither increasing nor decreasing. If the accidental death rate increases further, the population will decrease steadily, and eventually become zero. (If neutron-absorbing "impurities" are introduced in quantity, the absorption of the necessary neutrons will reduce the rate of the atomic pile reaction steadily, and eventually stop it.)

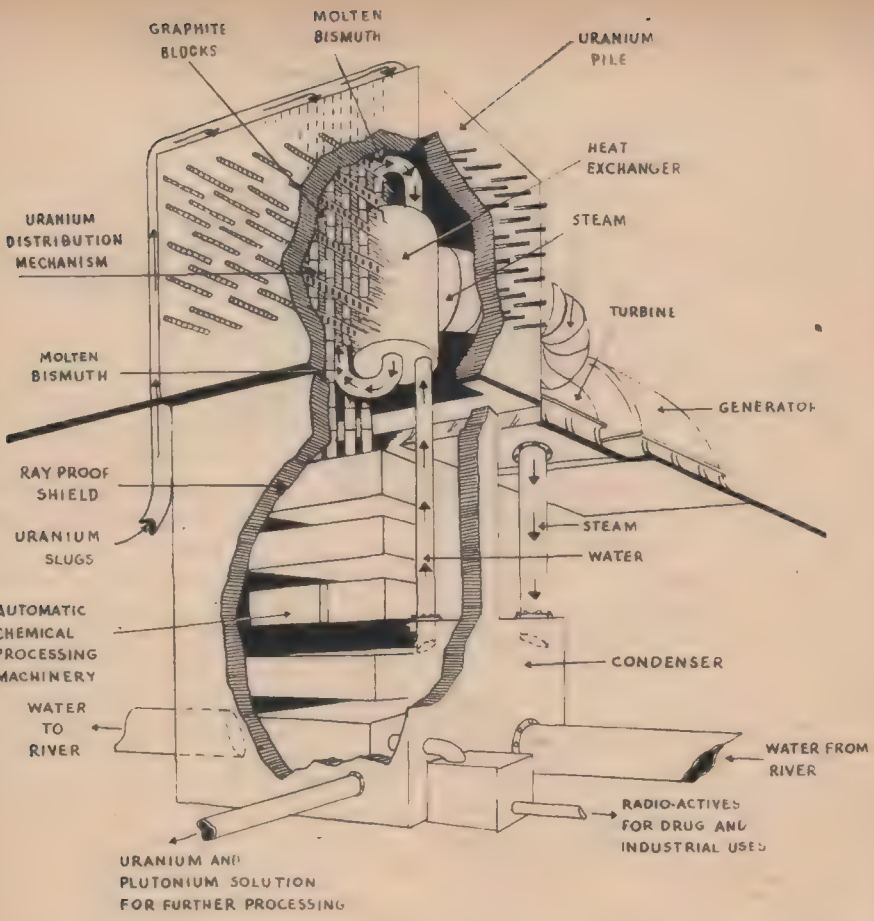
It's easy to understand how Reaction Four can be controlled by sheer size. If there is no such process as immigration, obviously the Principality of Monaco won't last long; any individual moving more than ten miles in a straight line will have emigrated. But the United States and Russia are in a different position: you have to move a long way to emigrate from large nations.

The remaining problem is to overcome the unfortunate tendency of neutrons to die bachelors—i.e., to be absorbed in U-238 nuclei without producing fission.

Since U-238 nuclei will absorb any neutron moving faster than that 25-volt speed, the obvious way to keep U-238 from soaking them up is to slow them down below that speed. Once below 25 volts, U-235 and only U-235—or impurities present—can absorb them. If the uranium is present in small lumps, neutrons produced by fission will escape—Reaction Four will enormously exceed all other reactions. The Principality of Monaco will have no population. But at this point we can introduce a fifth reaction—immigration from neighboring states. If there are a large number of small pieces of uranium, neutrons escaping from each will be available as immigrants for all the others. And while we can't effectively regulate the life of the neutron within the uranium lump, we can do a lot to it once it gets out of the uranium, where we can work on it.

In this case, what we want to do is simple; slow it down. Once it has been slowed below 25-volt speed, we'll be glad to have it immigrate into a uranium lump again; it will then be practically sure to wind up in a U-235 atom.

On an atom's-eye viewpoint, a lump of uranium consists of vast rows and files of something vaguely resembling a cumulous cloud in a clear sky. In the heart of each cloud of electron-shells is a tiny, exceedingly dense nucleus—as though the clouds had floating rocks in them. A neutron wandering at low speed into this environment will drift through the clouds, bump gently against a nucleus—and bounce. Drifting into another cloud,



Sniffen

General cutaway diagram of the structure of the atomic power plant proposed on the cover. Rods projecting from the pile are neutron-absorbing control rods. Both automatic, motor-driven, and separate manually operated emergency rods would be installed.

it bounces again. It may repeat the drift-bounce cycle fifty—one hundred—even two hundred times. Eventually, though, it will drift into a cloud, touch a nucleus—and be absorbed. Instantly the cloud erupts with a flash of violent radiation. It's a true atomic bomb: that nucleus was either a U-234 or, more probably, a U-235. The cloud vanishes instantaneously, exploding outward at enormous speeds as discrete electrons, mutually repelling each other violently now that the uranium

nucleus they were surrounding has vanished. The original nucleus is driving off in two opposite directions as two nearly equal fragments. These two fragments are quivering, surging and working violently, spitting electrons, hard radiation and—a neutron or two. They are like droplets of mercury flying out from under a hammer-blow on an anvil; each flying fragment of liquid pulsating violently as surface tension tries to draw it into a tiny sphere again. Each fission fragment nucleus is similarly pulsing and quivering as nuclear binding energies try to draw the one hundred twenty or so nuclear particles into a spherical form. Meanwhile, the fragment nucleus has much too plentiful a supply of neutrons for its supply of protons; electrons are spit out, each loss of an electron converting one neutron into a proton. And some whole neutrons are expelled—expelled at very high velocity, ready to start the cycle again.

Its high speed will quickly take such a neutron out of the uranium lump and into the space between lumps; then it's up to us to figure out a way of slowing it down below the critical 25-volt speed before letting it back in the uranium.

Lead has long been thought of as the ray-stopper *par excellence*. For stopping neutrons, it's one of the worst possible choices; the neutrons will bounce with fervor, vigor and vim—and no loss in speed. For neutron-slowing, we want hydrogen.

The reason is easily understood. Imagine a ballroom floor covered with bowling balls at regular two-foot intervals. A golf ball is driven across this floor with a lusty swing, smacks into one of the bowling balls, and bounces away at an angle, hits another, bounces, and so on. The struck bowling balls will rebound in a dignified, leisurely manner, while the golf ball goes on with almost undiminished speed. Of course, the golf ball loses a little energy each time, but not much. (Not, that is, if it's an ideal golf ball, and is one hundred per cent perfectly elastic—as are atomic particles.)

Let's change things; let's scatter golf balls at six-inch intervals on the ballroom floor, and try again. This time when the driven golf ball comes in, it strikes one of the placed balls, and they both bounce—hard and fast. The driven ball shares its energy about fifty-fifty with the struck ball, bounces, and hits another. Again it shares its energy fifty-fifty. After about the fourth collision, the ball isn't moving very rapidly. Golf balls, in other words, will absorb energy from a driven golf ball more rapidly than the far more massive bowling balls. In precisely the same way, hydrogen atoms—which weigh about the same as a neutron—will absorb energy from a hard-driven neutron far more rapidly than will the far more massive lead atoms.

Unfortunately for the beauty and simplicity of things, hydrogen isn't the right answer for a neutron-slowing "moderator"; hydrogen will slow them all right—but it will also combine with neutrons to produce deuterium—Hydrogen-2, or heavy

hydrogen. Ordinary hydrogen, then, would act as a neutron-absorbing impurity in an atomic pile, and has to be excluded. Hydrogen isn't a very active absorber, so a little hydrogen can be tolerated, but it can't be used as the moderator.

Since deuterium—heavy hydrogen—is the neutron-enriched product of hydrogen's reaction, heavy-hydrogen would make the ideal moderator. It can't be used as the gas, however, but would be used as heavy-hydrogen compounds such as paraffin or heavy water. The reason the gaseous form would not be satisfactory is readily understood; in our golf-ball ballroom analogy, if the golf balls were scattered at twenty-foot intervals, the slowing effect would be rather inefficient. In a gas, the atoms are so widely scattered as to be ineffective as moderators.

The Manhattan Project did not use heavy water in their Hanford piles for the simple reason that they didn't have any—or at least, not enough, at the time. A uranium pile using heavy water was established in the Argonne Laboratory, just outside Chicago, and proved extremely

International News Photo

At Clinton, now, the atomic pile is being used to produce synthetic radioactives for research. Unfortunately, it's hampered by, original—and unalterable—design for plutonium production. These first research piles were not designed for flexibility. See editorial.

efficient. Actually, heavy water has a marked advantage over any other moderator; light hydrogen when struck by a neutron tends to absorb it—but heavy hydrogen, when struck by a fast neutron, actually releases a neutron. It would actually increase the supply of neutrons available. There is an equilibrium, so that pure heavy-hydrogen water would tend to break down in use, while pure light-hydrogen water would tend to absorb neutrons and build up toward heavy-hydrogen water. Since heavy hydrogen can be obtained fairly cheaply by newly developed processes,* future atomic piles may use heavy-water moderator extensively.

Being unable to obtain heavy water in the desired quantities, the Manhattan researchers had to go on up the table of elements; if they couldn't get golf balls to scatter on the ballroom floor, they might be able to get something not too much bigger. Helium, the next element up, would make an almost ideal moderator—no neutron absorption, and a highly efficient neutron slower. Sadly, helium refuses, absolutely and with great determination, to form any compounds whatever, let alone solid or liquid compounds, and its boiling point is more than a little impracticable. And a gas can't be used.

Lithium, next heaviest element, eats neutrons alive. Keep it away!

Beryllium, element #4, will, like heavy hydrogen, release a neutron when struck by a fast neutron. Unfortunately beryllium, like heavy hydrogen, wasn't available.

Boron, #5, was readily available—and makes a fine element for controlling the reaction. It absorbs neutrons like a sponge.

Which is, of course, why the Hanford piles use graphite moderators—carbon being element #6. Highly purified graphite could be produced cheaply, in great quantity, and was available at once.

Using graphite blocks, with channels through them, the great Hanford piles were built up. Through some of the many channels water-cooling pipes are inserted. As nearly as can be made out from the Smyth Report, the uranium slugs, in aluminum cans, are in these same pipes; the point isn't clear. The important thing is that in addition to the graphite moderator and the uranium slugs, there must be, in the mass of the pile, various additional gagetry:

1. Cooling water and pipes conducting same.
2. Control rods—the mechanically introduced impurity.
3. Instruments for registering such things as temperature, gamma ray intensity, neutron density, rate of reaction, et cetera.

For all the inherent simplicity of a pile—slugs of uranium in simple

* The Manhattan Project developed several isotope separation systems, be it remembered. The hydrogen-heavy-hydrogen separation can be worked by a trick chemical exchange reaction, since there is such a great ratio of weight difference between H-1 and H-2 that the chemical properties are affected. If free gaseous hydrogen and hot steam are passed over the proper catalyst, there is a tendency for the somewhat more active H-1 in the free hydrogen to displace the somewhat more sluggish H-2 atoms in the water vapor. By a series of such cycles, gaseous H-2 can be obtained in quantity. This is a far more economical process than any previously known.

blocks of graphite—it gets complicated. It gets more complicated when it starts operating, too.

We very carefully purify the uranium to remove neutron-absorbing impurities. A few parts per million of such impurities as boron, cadmium or silver can be ruinous. But after the pile has been in operation a little while, a number of things have happened.

There is less U-235; it has been fissioned, and is gone.

There is less U-238; it has picked up neutrons and become first neptunium, then plutonium.

There is, now, some plutonium present.

There are, also, a collection of assorted fission product nuclei.*

The plutonium's all right; it acts just like U-235, so far as the nuclear reaction is concerned. But the fission products are *not* all right; many of them turn out to be fine neutron-absorbing impurities.

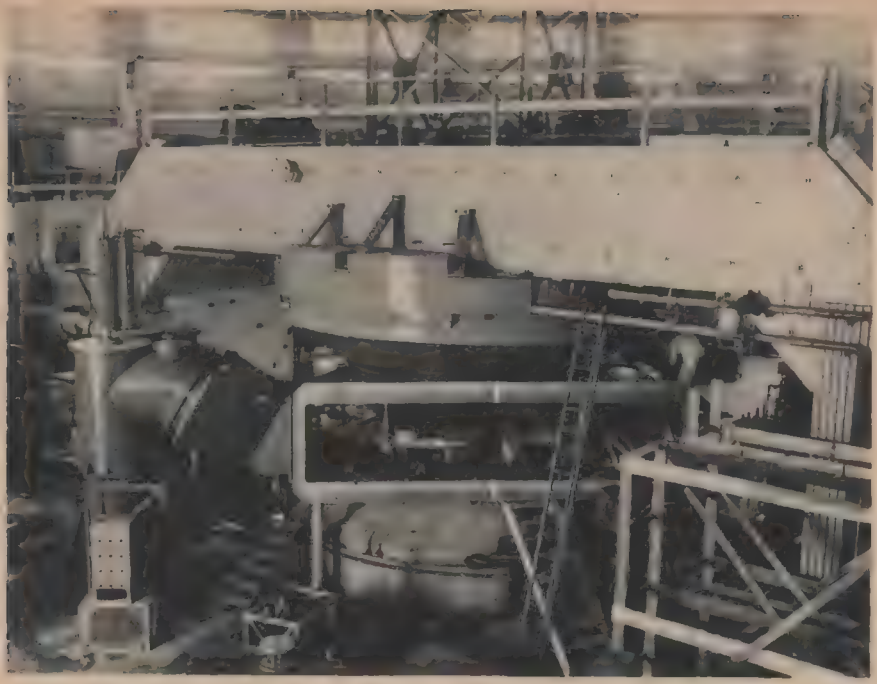
A pile cannot, therefore, simply be started and allowed to cook away indefinitely. The uranium slugs have to be removed periodically and purified by chemical processes to remove the accumulating fission products before they poison the whole pile.* In view of this necessity—and in view of the fact that anything that's been in an atomic pile is inconceivably deadly due to radioactivity—there is a neat problem in industrial chemistry to be handled. To wit: A one hundred per cent robot chemical refining plant must take in fantastically deadly, surcharged uranium slugs in their water-tight aluminum jackets, remove the aluminum cans, dissolve the uranium, and process the solution in such fashion as to separate the pure uranium, the plutonium, and the deadly radioactive fission products.

At Hanford, the separation is worked in that fashion. In industrial use, it would not be. As has been pointed out before in Astounding Science Fiction, all uranium, not just U-235, eventually is consumed in an atomic fission pile.

When U-235 fissions, one neutron is consumed, and somewhat more than two neutrons, on the average, are released. If both of the neutrons so produced are allowed to react in fission processes, the chain reaction will proceed forthwith to take off for the sky. The rate of reaction will simply increase without limit.

This is a somewhat undesirable state of affairs—around an industrial plant. Unlimited chain fission reactions are useful militarily only. Something must be done with that extra neutron or two produced at each fission: we need one new neutron for each neutron consumed in fission—but in a peaceful power plant we don't need, most definitely and decidedly don't want, two new ones around. Some material must be introduced into the pile to absorb

* The fission product nuclei are shot away when the U-235 fissions, but a particle having so extremely high an electrostatic charge as a barium nucleus can't move far through such dense matter as a uranium slug before it is halted. Therefore, practically speaking, all the fission product nuclei settle down to life as atoms in the uranium slugs, without escaping into the pile. The lighter, uncharged neutrons, on the other hand, readily slip out of the slugs into the surrounding graphite; they don't interact for thousands of angstroms around by virtue of terrific electric fields.



International News Photo

The new giant cyclotron at the University of California should be ready soon. The steps give some idea of its size; it's a Hollywoodian super-colossal. The cyclotron remains a preeminent nuclear research device, because it can accelerate charged particles to a preselected speed. The atomic pile supplies neutrons, and neutrons only, at unknown speeds.

the extra neutron, and keep it from taking the whole pile on a sky-ride. The neutron-absorber could be any of a great variety of "impurities"—cadmium, boron—a lot of things. But the obvious, the natural neutron absorber under the circumstances is U-238.

If the uranium slugs are small enough—say one inch diameter, one inch long—and enough moderator is placed between them, practically all the neutrons produced will escape capture by U-238. The resultant pile can be tied down only by the use of huge numbers of cadmium or boron control rods.

If the uranium slugs are each about two feet in diameter and two feet long, practically none of the neutrons produced will be able to escape into the moderator. The U-238 will get 'em all. That pile won't work.

Somewhere in between there is a size of slug which will allow the U-238 to absorb about half the neutrons produced, while the other half

escapes into the moderator, and is slowed down, to be returned for the next cycle of U-235 fission reactions.

Each U-235 fission, on the average, produces a bit *more than two* neutrons. That means one neutron consumed, one U-235 nucleus fissioned, one neutron freed for causing a new fission, one neutron absorbed by a U-238 nucleus, and an occasional extra neutron available to make up losses due to accidental absorption in impurities, escapes from the pile as a whole, and for raising the level of operation of the pile if desired. Ideally, the pile will be designed to operate at a stable operational level with the control rods—the mechanically introduced impurities of cadmium or boron—almost, but not quite, all the way out. This will mean that the maximum possible number of neutrons is being absorbed by U-238, the minimum being absorbed in impurities.

The world starts off with a certain quantity of U-235; that, and that isotope alone, is the key to atomic energy. With U-235, we can get atomic energy to transmute U-238 into fissionable Pu-239. Thorium, Th-232 is, like U-238, fissionable with very high-energy neutrons; like U-238 thorium can absorb a neutron without fission, become radioactive Th-233, and is transmuted into U-233—another fissionable uranium isotope. With U-235, we can burn Th-233.

But without U-235 we can release no atomic energy from any natural material known. U-235 is the basic resource.

Properly used, in a properly designed pile, it is possible to get a greater number of Pu-239 atoms as a product than the number of U-235 atoms burned to produce it. If a heavy-hydrogen moderated pile is used, additional neutrons from the heavy hydrogen will become available, and a still greater increase in the one great, key resource is possible.

A properly designed pile, in other words, will actually increase the world's resources of the key atomic fuel; an isotope which will fission with low-speed neutrons. U-235 is the only natural key material, but Pu-239 and U-233—made from thorium—are equivalent key materials.

One of the obvious results of these considerations is that within broad limits, a pile can use U-235 as a capital investment, only U-238—or thorium—being consumed as fuel. Although pure U-235 may cost fifty thousand dollars a pound, it would be practical to build a pile using enriched uranium—uranium containing, say, twenty per cent U-235—because the consumption of the added U-235 would be offset by a constant production of Pu-239 in the same proportion. Thus, only natural uranium need be added.

The cost of highly purified natural uranium, as now required in a uranium pile, is of the order of twenty dollars a pound. It's expensive, particularly in view of the capital investment required to set up the atomic power plant in the first place. As a price for fuel, it's a lot lower than the price of coal, since one pound is the equivalent of nearly

one thousand tons of coal. Nevertheless, at present it appears that the cost of original investment, set-up, and maintenance of the atomic power plant would run perhaps twenty to fifty per cent higher than the cost of an equivalent coal-powered station on the American Atlantic seaboard.

The answer is, of course, that coal is extremely cheap, there. But coal is not cheap in north-central Alaska, in central Brazil, nor in a great many other places on Earth. Further, the costs of operation of the atomic power plant will come down, just as the cost of operation of coal power plants have come down.

But in any case, the atomic power plant for industrial use can be described in general terms.

First, there will be the uranium-burning pile. That has been described. But the important details are the auxiliaries which must be added. In Hanford, Columbia River water carries away the heat, and the whole pile operates at a relatively low temperature. But for efficient heat-engines, such as steam turbines, high-temperature operation is essential. And the Hanford style pile will not operate at high temperatures because the uranium slugs are canned in aluminum, and the water is conducted through the pile in aluminum pipes. And saying, "Well—use steel then!" is *not* an answer. The cans for the uranium, and the pipes, must meet several unusual, critical conditions, the most important of which is that no constituent may have an appreciable neutron absorption. Iron does. It can't be used.

The only elements meeting the necessary nuclear physics requirements listed in the Smyth Report are lead, bismuth, tin, aluminum and beryllium; presumably there are a few more, but they fail by reason of other peculiarities. (If caesium, for instance, met the nuclear physics requirements, it wouldn't meet anything else. It melts like wax, has the physical strength of wax, and the chemical stability of dynamite.)

Unfortunately, no high-melting element except beryllium is on that list of nuclearly satisfactory elements—and beryllium is extremely difficult to purify. To date, pure beryllium has been extremely brittle, and unsatisfactory generally.

For satisfactory turbine operation, high-temperature steam is necessary; for the moment let's leave the problem of high-temperature pipes to the engineers. One possible solution is, after all, the development of reasonably strong graphite pipes. They'd have high melting point all right, though the mechanical strength leaves much to be desired. But if no water is used in the pile, we can get around the need for high-pressure pipes. We'll use a heat-exchanger system.

A heat-exchange medium is going to be required anyway. The pile itself must be behind a heavy wall of solid graphite. Graphite does not absorb neutrons, does not produce neutrons, but does bounce neutrons. Neutrons attempting to escape from the scene of action will tend to be

reflected by the wall of graphite, and so sent back where they can be used most effectively.

Beyond the graphite must be a shield wall of dense concrete and metal to absorb gamma rays, beta radiation—high speed electrons—and the assorted variety of atomic hell that leaks out of a functioning atomic furnace. If plain water is passed through such a pile, it, too, comes out loaded with death. Induced radioactivity in impurities, accidental pickups of highly activated material from the pile, a host of other things can surcharge it with danger. Anything that has been actually in the scene of atomic fire is deadly.

But if a heat-exchanger is used, we could circulate a liquid through the pile, where it is heated—and incidentally radioactivated—and out again, carrying the heat with it. Although activated, such a heat exchange medium would not be sufficiently active to make water in contact with it particularly dangerous. Thus the heat exchange medium could circulate through the pile, and out, beyond the first layer of shielding, to a heat-exchange system where it gave up its heat to generate steam, then back through the inner shield to the pile again. Water, pumped in through the outer shield to the heat exchanger would produce steam which could be brought out with fair safety to a turbine.

There are a number of possible heat-exchange media; in our drawing, we have suggested bismuth, which, although solid at room temperature, has a melting and boiling point that would make it quite satisfactory for steam production. Lead and tin would similarly be usable. Although helium can't be used as a moderator, it would make an excellent heat-exchange medium if a gaseous heat-exchanger were selected; it is completely and absolutely immune to radioactivation, very easily purified, and available in quantity, and has the best of nuclear physical properties for use in an atomic pile.

The heat cycle through the pile is only one of the many cycles involved. The uranium slug cycle is more complex mechanically—and chemically. The problem would be markedly eased in many respects if helium were used as a heat-exchange medium, because uranium metal itself has a high melting point—well over one thousand degrees centigrade—and if helium were the cooling medium, no cans would be necessary. Helium, unlike water, will not chemically attack uranium—or anything else.

The uranium slugs travel through the pile, moving slowly through channels cut through the graphite blocks from end to end. There's a type of bottled soft-drink dispenser that rather resembles the uranium slug transport; a nickel-in-the-slot gadget allows you to buy a bottle of warm drink. The warm bottle is thrust nose-down into a U-shaped tube that passes down through a cooling unit, pushing on the end of the previous bottle placed in the dispenser, and the thrust so transmitted pops a cold bottle up at the other end of the U-tube.

Similarly, fresh uranium slugs are pushed into the top of the pile by a uranium dispensing mechanism, and push out at the bottom the exhausted slug which has been longest in the pile.

From the pile, the uranium slug drops into automatic chemical processing machinery. At Hanford, such equipment is designed to make a three-way split; uranium, plutonium, and fission products. For commercial power piles, the split is two ways—fission products and fissionable material to be returned to the pile. The plutonium is needed to keep the pile going, and in addition, it is very difficult to separate it from the uranium. Uranium and plutonium—and neptunium too—have very nearly identical chemical properties, which makes their separation difficult, but would make it easy to take them out, together, from the very different chemical elements of the fission products.

The separated uranium and plutonium would then be reduced to metal again, and returned by the uranium slug distribution mechanism to the top of the pile.

The fission products would be available for industrial sale.

Control of the operating level of the pile is maintained by the mechanical introduction or withdrawal of "impurities"—rods of boron-bearing steel, or cadmium alloys. These are simply long, flat rods that can be driven into channels in the graphite blocks, and by increasing absorption of neutrons, choke off the atomic reaction.

Normally, control would be maintained by automatic devices, motor driven gears thrusting in, or withdrawing the rods as needed. But there will be a set of manually operated rods, completely separate from the automatic controls, to assure that emergency control can be maintained in event of power or other mechanical trouble. Probably, there will also be arrangement for some method of emergency dumping of a neutron-absorbing liquid material into the pile through channels in case of dire emergency.

A pile cannot explode in the true sense; if the moderator is removed, the U-238 atoms would absorb the necessary neutrons and quench the reaction completely. But if control were lost, and the reaction rate continued to climb, it would increase steadily until the moderator did give out—or the uranium somehow escaped the pile. In the case of a graphite moderated pile, the uranium would boil away before the graphite failed. Instead of an atomic bomb type explosion, therefore, a pile might, if all control were lost, simply boil out some fantastically poisonous tonnage of radioactivated material.

The danger is decidedly remote. The pile involves a slow-neutron reaction, not the fast-neutron fission reaction of the bomb. Furthermore, to assure control, the neutron-absorption in U-238 is made so high, in the original design, that the pile can only just barely work. To work at all, every attainable neutron from the U-235 fission must take part in the next fission cycle. Nearly all

the neutrons released by fissioning U-235 are released instantaneously —99.9% or so. Perhaps 0.1% are somewhat delayed, a fraction of a second or more up to as much as a minute or two.

At first glance that might seem unimportant; it is actually the key to control of the atomic pile. The pile is designed so that, with the control rods entirely out, perhaps 1.001 neutrons are produced for each neutron consumed in U-235 fission—all others actually emitted by fission products being absorbed in U-238 or impurities or by escape. If only 0.999 neutrons are available, then, in each cycle, there will be fewer fissions than in the previous cycle—the reaction will die out as surely as will a nation in which the death rate exceeds the birth rate.

But if 1.001 neutrons become available after each one-neutron consuming fission, the rate of reaction will increase steadily—as would the population of a nation with 1001 births for every 1000 deaths. If all the neutrons were released instantaneously, and there was only about a ten-millionth of a second between fission-neutron release-fission cycles, the reaction would go from nothing at all to explosion in a minute fraction of a second—it would, like the atomic bomb, be uncontrollable.

The fact that a very small percentage of neutrons are emitted only after a considerable delay makes control possible. If the pile is designed so that those delayed neutrons must take part to make the reaction go, we have plenty of time to control things; it will take time—very appreciable time—for the rate of reaction to change greatly. Instead of being fractional microseconds between fission-neutron release-fission cycles, it is minutes. If the increase is only 0.1% per cycle, and each cycle takes several minutes, it will be several hours before a great change in rate of reaction becomes apparent.

Atomic piles will be safe unless completely deserted for periods of several days at a time, a period preceded by long-continued mismanagement, neglect, and general lack of maintenance. Any good automatic control system should be good for several months of unattended care; if the equipment is in reasonably well-maintained condition, it would be safe to leave the pile unattended for weeks. There will certainly be plenty of time for manual control operation to shut down the pile if necessary.

It can, incidentally, be stopped much more quickly than it can be brought up to full power. By thrusting high-absorption control bars deep into the pile, it is easy to lower the neutron efficiency to almost any degree desired. Getting rid of neutrons by absorption is extremely easy; it's getting them in the first place that took the combined efforts of the world's top physicists, chemists, and engineers.

In addition to the readily appreciated products and by-products of the piles, such as radioisotopes, clinical radiations, power, heat, and the like, there are many far more subtle

by-products still to be investigated. Carbon atoms do not absorb neutrons, and are not particularly altered by gamma radiation, or any other form of atomic fire. But graphite, in the atomic pile, undergoes a completely unexplained alteration of mechanical properties, changes in electrical properties, and changes of crystal structure. Other materials exposed to the atomic hell-fire of the pile change mechanical properties; some become harder, some softer. Some conduct electricity better, some worse. Radiation has strange and still undetermined effects on matter. A new field of metallurgy may develop out of the atomic pile.

Radiation chemistry is another wholly new field that may develop out of the pile. The simplest type of radiation chemistry is the photosynthetic reaction of plants. Photographic film is based on radiation chemistry. But when the "radiation" involved becomes high-intensity. terrifically high-energy gamma rays, new and strange chemical reactions take place. What kinds of fine chemicals, pharmaceuticals, and the like can be produced by "impossible" chemical reactions, brought about by atoms suddenly activated by the impact of a 500,000 volt gamma ray, no one yet knows. It's a completely new field; all we know so far is that it exists. Gamma rays from the piles do cause totally new types of chemical reactions.

That field falls into the category of knowledge by-product at present; first there must be research. But then there will be industrial production of those new chemicals.

The biological effects will constitute a prime by-product, too—the development of new strains of yeasts, molds, and so forth. Mutated penicillin molds that produce drugs twenty—one hundred—times as potent. Mutated animals that suit our purposes better.

No one now can say what constitutes the main product of an atomic power plant!

THE END.

IN TIMES TO COME

Next month brings several items of interest. For some time we've been developing new artists; some of the new men are going to begin showing up more regularly soon. But in March, the cover will not be done by a new artist; it's a beauty done by an old, old hand at the game—Hubert Rogers. Rogers is back from the wars finally, and settled down again, this time in Vermont, and back in the cover business.

His first return engagement will go with a story by another returned veteran—Jack Williamson's "The Equalizer." It's the tale of the return of an expedition—twenty years out in space—to find Earth's great cities deserted, the totalitarian government of the planet vanished—and not a sign anywhere of any violence of any kind whatever! Not a corpse, a broken building—nothing!

Incidentally, we'd appreciate your comments on the new type paper—and, in particular, on the new type art work that the new paper will permit. The old bulked-pulp type does not permit the use of fine shadings, fine gradations of tone. The art work henceforth will be improved both by better workmanship, better reproduction, and the fact that the artists will be free to use different techniques because of the better reproduction method.

THE EDITOR.

THE TIMID TIGER

BY ERIC FRANK RUSSELL

Lord knows, the patterns of human cultures are varied enough, though all are based on human characteristics and abilities. On another planet, with an alien race of alien characteristics . . .

Illustrated by Orban

Vast and tropical was the home of the timid tiger. There, the heat was oppressive, and moisture fell in great blobs, and only a fantastic light seeped past the mighty trees. The trunks of the trees were tremendous columns soaring up and into the ceiling of thick, ever-present mist, and between them the varicolored grasses made a rich carpet along the jungle aisles.

In one of these aisles, as in the nave of a woody cathedral, dwarfed by vegetable immensity, Sam Gleeson knelt hip-deep in the carpet and poured a few more drops of ammoniated tincture of quinine between the lips of a prostrate Greenie. Four taller, lankier Greenies stood behind him watching gravely. The one he was ministering was female and below puberty.

By Venusian standards, a moppet. Somebody's kid sister. He wondered whether she'd yet learned to write.

The patter of drops sounded constantly as the mist condensed and dripped down. The prostrate one licked her lips and shivered. The watching quartet leaned on their long blowpipes, their eyes intent, and the tiny green figure shivered again. She opened her eyes, revealing great, brilliant orbs like those of a cat. Her hand smoothed her grass skirt and she struggled to sit up.

"She'll be all right now," asserted Sam. He signed to one of the natives. "Sit down with your back to hers to give her support. Let her rest thus for the period of one cigarette-smoke. Then give her this—all of it." He handed over a small phial. "It will do her good. When she has taken it, bear her home that she may sleep."

His knee joints creaked a little as he came erect. Closing his satchel, he hooked it on his cross-strap, swung it round behind him. Perspiration glossed his wizened face and beaded his white, goatee beard. Microscopic pearls of moisture shone in his bleached hair which had never known a hat.

One of the Greenies said, in his swift and liquid tongue, "For this, Earthman, you shall be the little one's father's father's father. The singing reeds shall tell of you to the trees."

"It is nothing," smiled Sam. "I become a great grandfather about once a month. Kids will be kids right across the Milky Way."

They made no reply to that. They had sudden taciturn moments that were disconcerting. Leaving them, he tramped along the glade, on through the welter of the rain forest. He was following an almost indiscernible path which, in an hour's walking, should bring him to his solitary cabin.

A shrill whistle sounded back in the glade now cut off from view by massive trunks. Without looking round he listened for an occasional swish of grass behind and to either side of him. Presently, it came, faint but persistent. He knew it would accompany him all the way home and he made a great pretense of being completely unaware of it. That pretense was proper. It was the polite thing for him to do—just as it was polite of them not to permit a friend to travel alone, without a bodyguard.

From the dark interior of his cabin he looked through his window hoping to catch a glimpse of his escort. It was their habit to circle his shack until his light went up. Once only he'd seen them, vague, shadowy figures gliding swiftly between trees. But he couldn't spot them this time. Sighing, he lit his kerosene lamp. Then he dug out his report book, made an entry in clear, firm hand.

Again this afternoon I found one standing before my window. He was waiting with the solemn patience of a green statue. I cannot persuade them to knock on the door and come straight in—they remain convinced that that would be insolent. So they stand and wait some

place where I'll see them. This one said that an hour to the north was a little girl with a curse in her belly. Of course, it was Raeder's Fever. I reached her in plenty of time and a stiff dose of quinine did the rest.

He stopped writing, gazed thoughtfully at the wall, stroked his goatee while murmuring to himself:

"No use mentioning that this is the seventh case in a child. It's not important, and it's already on the records. I still think Old Ma Nature has a remedy for everything and that somewhere on this planet is cinchona or a good Venusian substitute."

Putting away his book, he stood at the window and looked out again. The half-light that was day slowly faded to the luminous dark that was night. A mellow warbler began to flute five hundred feet up. There was a smell of trodden grass and of slumbering trees. He turned the lamp up a little more, went to his bookshelf, studied the small row of tomes. Howard Sax's "Medicinal Flora," Professor Wentworthy's "Root Of All Good," Gunnar Hjalmsen's "Natural Drugs," Dr. Reilly's "Hahnemann's Theory" and a mere dozen more . He'd read them all, and again, and again. Finally, he selected Walter Kayser's "How To Eat A Cannibal" and settled down with it.

In dealing with primitive peoples it is essential to establish complete mastery from the start, to establish it firmly, without equivocation, and thereafter to maintain it by reacting sharply to anything which may be construed as a challenge. This means that while being fair, one must be firm; one must be harsh if circumstances so warrant, even brutal if necessary. The savage understands savagery if nothing else, and it is not for the club habitué in New York or London, but the administrator on the spot, with a heavy burden of responsibility upon him, to determine precisely how and when—

Sam frowned as he always did at this point. He had an intense admiration for Kayser, one of Earth's ablest men. This Kayser was now East Indies Controller of Native Peoples, an important post of high honor. It ill became one to disagree with a man of such eminence, but some of Kayser's views made him very fidgety.

As for missionaries, they are good men oft made injudicious by their own enthusiasms. I like to see them—but not in lawless territory. One has only to consider the list of these brave men slaughtered by Dyaks in the Fly River area of Borneo alone to realize that they should time their arrivals a little later, when the country has settled down. Wild and bloody aborigines must be taught to fear God before they're invited to love Him.

Well, it was an old book, written when Kayser was young and somewhat fiery. Perhaps he'd changed now. Men usually changed with the passing years. Maybe he'd mellowed into gentler wisdom like Victor Hearn, the famous Consul of Luna, or Jabez Anderson, the equally great Consul of Mars. They were all very great men, able men, worthy pillars of the civilization which, having covered the Earth, had spread to the heavens.

With which conceding thought, Sam Gleeson went to bed.

All day he had plenty to occupy his mind and keep his hands busy. Besides the cooking of his own meals and various household chores there was the pressure of getting things ready in time for the next flight to Earth due in less than three weeks. When flights were timed as far apart as eight months, you just couldn't afford to miss one, and he'd a lot of stuff to consign to Terra.

Most of it was packed in readiness, some had still to be prepared. Those eight fine samples of *odontoglossum venusii* would have to be color-photographed, sketched, dried out and packed before they wilted. He had seventeen samples of bark and a report on one saying that natives distilled from it a crude exhilarant similar to cocaine. In his simple cabin were no facilities for doing fractional analyses and he wasn't a qualified chemist anyway. He was merely a field explorer for the National Botanical Institute and they'd do all the laboratory work.

His water-color sketches of the flowers were talented, but no collector would ever go searching for genuine Gleesons. Packing his sketches along with the spectochromes, he put the flowers deep in eight little fused-quartz bowls, sprinkled fine silver sand over them until they were covered, slid the bowls into a small oven. Leaving them to dry out, he went to the door and opened it. A Greenie was standing outside. The native posed a dozen feet from the door, his long blowpipe in one hand, an expression of ineffable patience on his sharp features.

"Well?" said Sam.

"Earthman, the Voice of my people would talk with you."

Sam looked around, stroked his beard worriedly. More natives waited between the trees. A bodyguard again.

"I am sorry, but I cannot come. I am extremely busy." He looked straight into the other's great cat-eyes. His voice was gentle. "I am very sorry." He went inside and closed the door.

The *odontoglossum venusii* dried out nicely and he repacked them and marked each sample box carefully. Sultriness had got him sweating again, and the beads of it collected in the myriad wrinkles at the corners of his eyes. Finishing the job, he ate, pondered awhile, then opened the door. Two hours had passed but the Greenie still stood there and his fellows still lurked in the background.

"I told you I could not come."

"Yes, Earthman."

Sam felt slightly confused. His mind was full of flowers and herbs and barks, not to mention the urgency of catching the coming flight.

"Why does the Voice want me?" he asked in an effort to clarify the situation.

"Lo, there is death over the mountains and six have died by each other's hands, three of our people and three of yours. Therefore the Voice has said that he must have word with the Gray Chanter or with you. 'Be ye fleet

of foot,' he said, 'that I may speak with one.'"

"Hmph!" He stewed it over in his mind. Four years had he lived among the Greenies, but never had he met a Voice. Now was a mighty poor time to make up the deficiency. It would cost him a week. He could ill spare a week. "Did you speak with the Gray Chanter?" he asked.

"Earthman, we have seen him."

"And wouldn't he go?"

"He tried to. He came a little way. Then he struggled with his ghost and came a little further, but his feet were weary within a hundred paces."

"What, is he, too, cursed?" Sam was alarmed at the thought of Father Rooney sick in his solitude sixty miles to the south.

"He said, 'Alas, I am old and feeble, and my ancient bones refuse to be dragged. Seek the Wizened One and tell him that my ghost is willing but my carcass mutinies.'"

"Wait," said Sam. He went inside, tidied up swiftly, got his satchel, saw that it held all he required. He'd no hat to put on and had never owned a gun. In all probability, he and Father Rooney were the only ones unarmed of the two thousand Terrestrials on Venus.

Before leaving, he took up an old letter, scanned it for the hundredth time. His beard bristled as he murmured its phrases. "You are employed for botanical and not for sociological research . . . expected to devote more time to flora and less to fauna . . . native welfare belongs to the proper department . . . last warning . . . your resignation—" He tore up the letter, stuffed its pieces into the embers beneath the oven, went out. His goatee was cocked defiantly as he emerged from the cabin.

A call good enough to arouse the aged priest was good enough to be answered by him. And besides—it was imperative that Terra should know the tiger, to walk in peace.

The native with whom he'd talked glided along in the lead and Sam followed at a steady, determined pace. The others shadowed silently behind. In single file they slipped through the half-light and the grasses while the mist swirled round the treetops and the dew dripped steadily down.

To reach a village they marched far into the night, with luminous herbs glowing pinkly in the growth through which they trod, and an occasional beacon tree shining like a giant specter between other darker trunks. Only one incident caused a momentary pause in their progress, this being when they found an immense constrictor lying across their path.

The reptile had a body three feet thick and its head and tail ran far away among the trees on either side. Its hide was an even dull-gray, and in the night-time darkness that was never dark Sam could see the rise and fall of its sluggish breathing. It was asleep. They jumped it in rapid succession, then ran for a mile. So long as a man saw a

constrictor before it saw him, he was safe—he could just outpace it.

A tiny village of lattice huts gave them food and shelter for the remainder of the night. They breakfasted on baked fish, *maro* roots and heavy bread washed down by genuine coffee. The latter had been the first discovery on Venus, and one regarded as sensational by Terrestrial botanists. This, together with the similarity between Venusians and Terrestrials, suggested parallel development of the two planets, producing many things of mutual resemblance, perhaps some identical. Sam was alone in thinking the parallelism somewhat askew. He knew the Greenies!

They were away before the first fishers set out to bait the roaring streams, before the first wild turkey could utter its eerie whistle to the dawn. Still in single file, they glided like phantoms through the rain forest which seemed never-ending, and late in the afternoon of the third day they slipped from a spur of immense trees and found themselves near to the mountains. One couldn't see the mountains, for they were deeply buried in the clouds, but one could see partway across a gradually rising plain which eventually met the mist at an elevation of more than a thousand feet—tree height.

Before them stood the village of the Voice, a large conglomeration of squat, rock-built houses. Their roofs were of pale slate, their windows of laminated quartz. The place stood in amazing contrast with the flimsy lattice hamlets deep in the forest. Around lay small, cultivated fields through which two narrow and noisy mountain streams pounded in liquid ecstasy. Sam had never seen anything like this, though he'd heard of it. The Greenies went up another notch in his estimation.

He found the Voice sitting on a stool in the main room of the central house. The chief proved to be a tall, slender native of well-preserved middle age. His green face was narrow and sharp and bore the peculiar pineapple marking of his kind. Like all Venusians, he was completely hairless and possessed great yellow eyes with slotted, catlike pupils.

Sam gave him a precious cigarette, lit it for him, sat on the stool facing him. There were no salutations among the Greenies. The chief stared at him imperturbably and dragged at his cigarette. After a while, he spoke.

"I am the Voice of my people."

Sam went through the polite routine of affecting dumfounded surprise. Dipping into his satchel, he produced a full pack of cigarettes, gave them to the other. The chief accepted them graciously.

"You do not smoke?"

"I am awaiting your permission," said Sam.

The feline pupils widened as he studied Sam for a long time. The stare was unblinking.

"Smoke!" said the Voice.

Digging out a pellet, Sam lit up. No use hurrying the chief. He'd take his own time and, probably, there'd be the usual cross-examination before he got down to business.

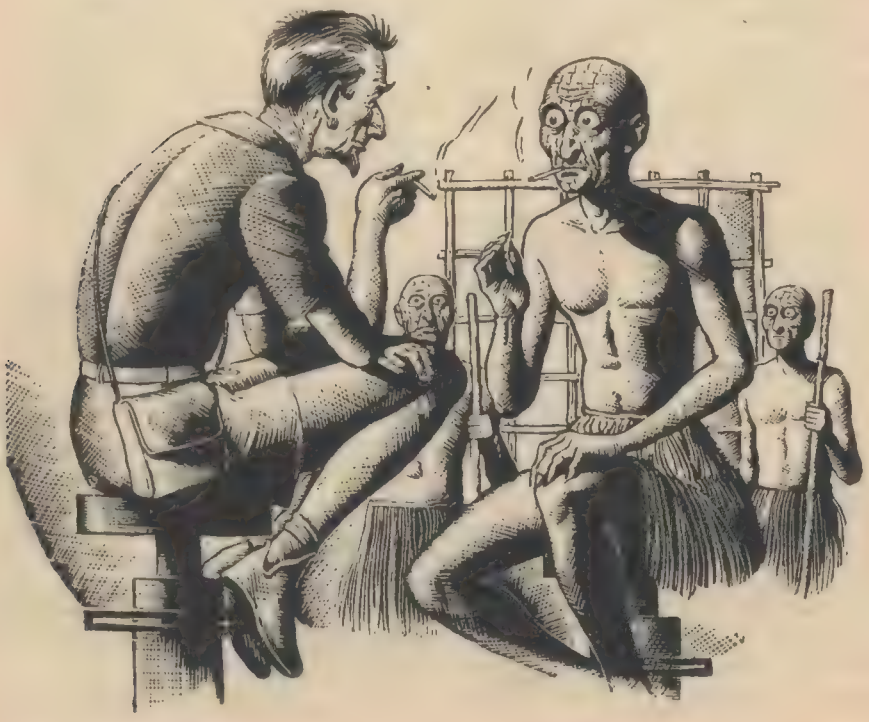
"You speak with my mouth, as does the Gray Chanter," the chief remarked. "Other Earthmen do not, and content themselves with childish signs and gestures. Why?"

Sam fidgeted while he considered the matter. In the outlands, one had to be a diplomat among other things.

"My work," he explained carefully, "keeps me among your people. It is the same with the Gray Chanter. How can we acquire friends and neighbors if we speak not with their mouths? Would you that I sat among the trees and nursed a lonely ghost?" Sam paused inquiringly, but the chief said nothing, so he went on. "Therefore I learned so to speak, as did the Gray Chanter."

"And what of the others?" asked the chief, his great orbs still fixed and blinkless.

"Other men have other tasks. They work together and are not alone. Many work harder and longer hours than I do, and they have not time to acquire other mouths. Some have not the ability because their virtues lie elsewhere. For me, it was easy. For the Gray



Chanter it was not so easy. For others it may be hard."

The chief made no comment. He spurted a stream of smoke from between thin lips while his eyes did not shift a fraction. It didn't worry Sam. He'd got used to cat-eyes and to cat-stares, as one did after a while. Fifty months in the rain forest, and you began to understand Greenies—but only began! While he smoked and waited for the next question, he thought idly of Burrough's description of the first Venusian seen by a Terrestrial: physically four-fifths human and one-fifth heaven-knows-what; mentally four-fifths human and one-fifth cat. There was certainly a touch of cat behind their feline eyes; moments of drowsy thoughtfulness, moments of enigmatic stares. They had all the patience of cats, and often the same quiet dignity.

"I am what I am," said the chief suddenly, "and all my people are even thus. There are no differences, neither here, nor across the mountains, nor on the other side of our world. Yet you, an Earthman, have a countenance brown and wrinkled and moss-grown like the bark of an old *radus* tree, while the Gray Chanter, also an Earthman, is smooth and pale with the lightness of dawn."

"There is Cherokee in me," said Sam uninformatively. Then added, "There are men of many colors on Earth, some white, some red, some black, brown or yellow."

"Ah!" The chief was interested. "And any—green?"

"No, there aren't any green ones on Earth." His tongue got ahead of his mind as he commented, with a grin, "There are some said to be green." Then he frowned, put in hastily, "But they are not."

He wished it could have been unsaid even as the other pounced on it. He should have known the direct Venusian mind well enough not to have made such a slip.

"If they are not green," demanded the chief with perfect logic, "why call them green?"

The smile had vanished from Sam's face and the brilliant eyes were still upon him while his mind searched frantically for an explanation which would satisfy the literal-minded Venusian without hurting his feelings.

Finally, he said, "They are people who're honest, straightforward, without guile. Those are thought to be the virtues of green ghosts. Therefore they are said to be green."

The chief let it pass unchallenged, and still his eyes neither blinked nor shifted their steady gaze. The way they timed their silences added greatly to difficulties of conversation with Venusians, for you could never tell whether you'd convinced them or not. They had an embarrassing habit of asking pointed questions, and their usual response to an answer was another and more awkward question. This silence was a long one and outlasted the chief's cigarette.

In the end, the chief said, "I know many tales of you, Wizened

One, for my mind does not miss the slide of a dewdrop down a leaf. I know that you are good." He paused a moment. "Some are good, some are not good. But of you and the Gray Chanter I know naught but good."

This, uttered in a level voice and accompanied by that hypnotic stare, made Sam feel feeble. He waved a hand in futile dismissal, sought words adequate to the occasion. A halo ill-became his grizzled pate and he'd feel better without it. From his viewpoint, he'd done nothing but lend an occasional helping hand and mind his own business. Back home in Neosho they called it being neighborly, and they spoke well of you for it, but handed out no diplomas. Before he could find anything to say, the chief went on.

"Now there is great trouble between your people and mine, and death stalks across the mountains. It is an evil thing, for it may spread as the waters spread when they break their bounds. I do not wish to see our forests sheltering only the hunters and the hunted—with no man daring to withhold death from the good lest the good prove bad."

Sam leaned forward, his leathery features intent, the crinkles deepening at the corners of his eyes. There had been trouble, mild trouble, between men and Greenies in the first months of settlement five years ago. Wisdom on both sides had abated it and there'd been no more since. But always it was feared. As Terrestrials gradually grew in numbers so also grew the risk that somebody might start something that couldn't be stopped. He didn't want that. Nobody in full possession of his senses wanted it.

"I am called Elran the Older," continued the chief. "Over the mountains are the people of Elran the Younger. He is my brother. And beyond his lands lie the pastures of the people of Mithra the Silent. My mate is Mithra's sister, and he is my brother-by-bond."

"So?"

"On Mithra's lands are Earthmen. They have been there nearly a year. They have been cutting into his land for some precious mineral, and Mithra approved because he had made a treaty with them. Now a difference has arisen. The Earthmen waxed arrogant and threatening. They brought out their fire weapons." His great eyes lidded for a fraction of a second. "They killed three of Mithra's people."

Sam sucked in his breath, then asked, "And what did Mithra do?"

"He took three for three. By patience and by craft he snared them. They bristled with darts as a tree bristles with leaves and they'd lost their ghosts before they hit the ground. With darts and cords he struck in the night and pulled down all the wires that stretched across the roof of the Earthmen's far-speaking house, thus preventing them from summoning a blast-ship to their aid. Now the Earthmen are sitting in their house and have made it a fort.

Mithra has surrounded it and awaits the decision of our kind—for the cry of evil is answered by the cry of good and our mind has got to tip the balance one way or the other."

"This," said Sam, "is bad."

"In the beginning, when Earthmen came to us out of the mist, there was death. But Vaxtre the Ancient and the Earthman we called Tall One came together in wisdom and made peace. Now I am of a mind, Wizened One, that perhaps you and Mithra can achieve the same before it is too late. If not—as Mithra does we shall all do, here and everywhere. A stifled scream is unheard in the glades."

"I shall see Mithra," promised Sam. "I shall go to him at once."

He was off again within the hour. Three days would bring him to the seat of the trouble: one day through the Great Valley and into the land of Elran the Younger, two more days to reach Mithra. That made a total of six days from the cabin to his destination and six days back. If he got stuck too long wherever he was going, his consignment would miss the ship. It required four days to transport it from the cabin to the spaceport. The margin was small.

His face was grim as he thought of that letter. "Native welfare belongs to the proper department." There wasn't a proper department on Venus. There wasn't even a Consul yet! There was only a spaceport still under construction and few Terrestrials outside of it; the majority clung together against the time when their numbers would be more. Those armchair warmers back on Earth ought to be exported and given a taste of forest life. They'd see things differently, after that. "Last warning . . . your resignation may be required." What did they think he was—a root-grubbing automaton?

The Greenie in front seemed to sense his urgency, for he loped along at top pace. The daylight, poor and inadequate by Terrestrial standards, didn't bother the native in the least, and neither did the fall of night. Daytime or night, it was all the same to these people. They could see equally well in either.

Ground rose up and the mist lowered. They were barely beneath the swirling canopy as they sped through the valley. It was a nuisance, that everlasting fog and, but for radar, would have made all spaceship landings impossibly dangerous. It hung over them like a perpetual shroud, and rays from the invisible sun struggled through so diffused that they threw no shadows.

Mid-afternoon of the second day brought them to the verge of the rain forest which encroached halfway across the lands of Elran the Younger. They plunged into it. That night they ate well, for an incautious turkey forgot to freeze in the gloom as they went past and a blown dart brought it down. The thing was featherless, reptile-skinned and bore no resemblance to a bird except that its cooked

flesh was indistinguishable from that of roasted turkey.

Mithra's village was reached a couple of hours ahead of estimated time. It, too, proved to be stone-built, a little smaller than that of Elran the Older, and it was built upon a knoll from which the eternal forest had retreated in all directions. Within a radius of three miles the ground was clear of giant timber and well-tilled.

The Voice himself talked first with the escort, then summoned Sam. The latter found Mithra to be another middle-aged Greenie, shorter and stockier than Elran the Older, and with eyes of light amber.

"I am the Voice of my people," he said formally. Sam offered no reply, knowing that none was expected, but put on the usual surprise act. The chief came quickly to the point, showing himself more abrupt than his distant brother-by-bond. "I know of you as all know of you. Here, you are welcome—but I know not what you can do."

"What happened?" inquired Sam.

"An Earthman came when the life-tide was rising in the trees and stayed until it ebbed. He talked not with our mouth and spoke only by signs and picture writing. We gave him room and nourished his belly, for he was of our shape and alone. For many days he sought among the rocks, along the earth-cracks and the chasms, until one day he came to me with his ghost a-dancing and said he'd found that which he'd been seeking. It was merely a vein of *rilla* metal which is of no use to man or beast."

"It hardens and toughens steel beyond belief," Sam told him. "There is none on Earth. We can use it in constructing spaceships."

"I made a treaty with him," the chief went on, "whereby he could dig up all the *rilla* metal within one hundred man-lengths of his discovery. He went away. A long time later, he came back with five others. My people helped them build a rock house. Over this house the Earthmen put a web of wires and through it they talked to a blast-ship and brought it down to them through the mist. Twenty more Earthmen came from the ship, with much machinery. The ship departed. Those left behind used the machinery to dig up and melt the *rilla* metal. They worked for almost a year and sent away much of it until there was no more." He hooded his eyes in thought while Sam waited for him to continue.

"Then they came and told me that there is a lot more *rilla* metal within this hill. They said they must have it, village or no village, and that I must make another treaty. I refused. They grew wrath and threatened to release my ghost. One of my people raised his blowpipe and they turned their weapons on him. We buried him in the dark. The Earthmen ran back to their house with many of my young men following in their tracks. We buried two of those also! The next night we trapped three Earthmen and appeased our dead. We also tore down the web

of wires above the house and surrounded the place with warriors. Since then, they have not dared to come out and we have not dared to go in."

"May I speak with these Earthmen?" Sam asked.

The chief didn't hesitate, and said, "You shall be conducted to them whenever you wish."

"In the morning, then. I would first like to look around the village and the hill, also examine the place from which the *rilla* metal has been taken."

The building that had become a fort rested alongside another knoll a mile and a half to the south of Mithra's place. It squatted dull and menacing in the poor light of morning.

Countless Greenies prowled phantomlike in the nearest spurs of the rain forest. Some had huge, multi-mouthed blowguns which needed the simultaneous impulse of six men but could throw heavy darts more than two hundred yards. Others bore accurate and vicious arbalests fitted with heavy metal springs and low-geared winders—a weapon Sam had never seen before. Although he did not come across any on his way to the fort, Sam knew that the Venusians also possessed flame throwers of alarming efficiency. The entire horde kept to the fringes of the forest, well out of range of the fort, and were content to wait. If you crouch by a water hole long enough, the trembling roebuck is bound to appear.

He tramped toward the house with his hands in his pockets, his goatee bristling, and an air of confident nonchalance which might serve to stay any itchy trigger-fingers behind those walls. In the bad illumination Earth-eyes couldn't distinguish friend from foe at any range greater than a voice could carry. The Greenies knew no such handicap. Folks back on Earth who blandly assumed that on any new world one automatically fitted in just couldn't realize the toughness of little things, such as being, by comparison, half-blind. It was always the little things that proved tough. Not the big ones. A bullet in the abdomen was only a little thing. His stomach jumped at the thought.

But no shot sounded. Within fifty yards of the house he passed a board crudely lettered: **Terraloid Corporation.** That wasn't so good. Terraloid were big and powerful and not in business for the sake of their health. Their reputation wasn't evil, and they'd never been known to pull a deliberate swindle, but they were go-getters, efficient, impatient, unwilling to bide their time. Commercially, they were short-cut artists and more than once they'd fallen foul of consuls by their eagerness to march too far in advance of events.

A big, beefy man opened the door, growled, "How the blazes did you get here without masquerading as a pincushion? Don't you know there's plenty trouble hereabouts?"

"That's what I've come to discuss with you. Mithra sent me."

"Ho-hum, a dove of peace!" rumbled the other with a trace of sarcasm. He conducted Sam to an inner room in which were a dozen men, some cleaning and adjusting weapons, others busily completing a new web antenna. "Boys, here's a negotiator." They looked up disinterestedly. The big man sank into a chair which creaked under his weight, said to Sam, "I'm Clem Mason, manager of this outfit. Who're you, why did Mithra pick you out, what's he want to say, and what authority have you got —if any?"

"I'm Sam Gleeson. I'm merely a fieldman for the National Botanical Institute—for as long as that job lasts, which won't be long!" replied Sam evenly. "I've got as much authority as that gives me, which is none whatever. As for the reason why Mithra called me in, I guess it was because I speak his language and know his people." As an afterthought, he added, "And probably because Father Rooney couldn't come."

"Father Rooney!" Clem Mason scowled. "Never heard of him! But we don't want any priests interfering in this. They tell tales back home and the story loses nothing in the telling. Then boudoir warriors complain to the newscasts and the public tears its hair and the next thing you know we've got to say, 'Yes, sir,' and 'No, sir,' and 'Thank you very much, sir,' to every stinking aborigine who comes our way. Why can't people leave us to do our own dickering?" He glanced across at the well-oiled guns. "We know how!"

Sam smiled broadly and said, "Seems it's up to you and me to cool things down before Father Rooney comes along to make more trouble, eh?"

The other thought that one over, then growled begrudgingly, "Maybe you've got something!"

"I've heard Mithra's story about what happened," Sam pursued. "Let me hear yours. Then we'll see what we can do to straighten things out."

"It's simple. We worked out a *rilla* vein which we'd got under covenant with Mithra. It was a tentacle broken off from a mother lode some place. Our instruments found the lode far down under the northward knoll. There's tons of the stuff, and it's needed badly. Then we got all balled up because none of us knows a word of Venusian. We drew pictures and played snake-arms for hours trying to explain to Mithra that we'd found Aladdin's cave way down under his cellar and that we wanted another covenant to get it out. We offered him fair terms, were willing to play square, but the more we argued the tougher he got."

"Go on," Sam encouraged.

"I got riled by his stubbornness and cursed him for a skinny green nitwit. I knew he couldn't understand English anyway. After that, it was a case of one durned thing leading to another."

"In what way?"

"A young Greenie among Mithra's crowd lifted his blowpipe. Maybe he didn't like the way I'd said what I'd said. Or maybe he lifted it with nothing in mind. But Fargher was jumpy and taking no chances and popped him on the spot. We beat it back here with a splurge of angry Greenies slinking after us through the night, and we had to blow back at them to hold them a bit. I don't know whether we hurt any more."

"You killed two," Sam informed.

Mason made a negligent gesture and continued, "They were mighty swift to call it quits. They caught Fargher and Meakin and Wills out in the darkness and mauled them in ten seconds flat! They blew cord-carrying darts across the roof and lugged down our web. Since then, we've stuck to the house and tried to call base on our portable, but the range is too long, and intervening mountains blot us out. So we're going to fix up a new web and they had better not try to get *that* down! We'll get a blast-ship here. After that, the

fashionable attire for well-dressed Greenies will be sackcloth and ashes!"

"Trouble begets trouble," opined Sam. "I fear me that this is no petty skirmish with a local tribe. It isn't as simple as that. I've been getting the hang of some queer things about these Venusians. They've no tribes, no nations. They've no local patriotisms—but they're Venus-conscious! They've only one color, one language, and one something-else I've not yet been able to identify. But the divide and rule principle just won't work on this planet, for the woes of one are the woes of all."

"Never mind the lectures," put in Mason sourly. "Say what you've got to say and let's go digging."

"The point I'm trying to drive home is that you can't indulge in purely local shenanigans. Even Elran the Older, three days march away across the mountains, knows all that's going on and is ready to do exactly what Mithra does. The alternative to peace is an Earth-Venus war. For all our superior weapons, there are only a couple of thousand of us on the planet. There are umpteen millions of Greenies, and we've got to seek them out, one at a time, every man jack of them, in the biggest jungle in the solar system. Fat lot of use our blast-ships and atomizers will prove in circumstances like that!" He mused a moment. "What's the use of the mightiest power if it can't be applied?"

"We can apply it all right," Mason asserted. "You've sat on your buttocks too long—you've forgotten the planet behind the two thousand!"

"Behind them for three weeks every eight months!" Sam retorted. "You know we're planet-raking before our time. We've not yet developed spaceships good enough to chase a world around its orbit. In another fifty years, maybe—but not yet. That shaves us down somewhat, doesn't it? Earth's in a poor position to conquer Venus by force."

"That's your—" Mason began, but Sam interrupted him.

"Let me go on. You want *rilla* metal. That's all you're here for. If you can't get it by cajoling Mithra, it'll come a lot cheaper than by fighting him for it. If you're a shareholder, you should appreciate that. If you're not holding any of their stock, why should you do Terraloid's blood-letting?"

"He's dead to rights there, Clem," put in one of the listening men. "I came here to get on with a job of work and land home with a whole skin and plenty of moola. If there's any pushing around to be done, let 'em call in the marines!" Several others murmured agreement.

"O.K.," said Mason. He hooked big thumbs in the armholes of his vest, tilted backward in his chair. "So we soothe Mithra—how?"

"Can you get out that *rilla* without wrecking his village?"

"Sure we can. It's down deep. We can run side shafts from the base of the knoll. It's dead easy!"

"Did you explain that to Mithra?"

"Goldarn it! That's what we tried to do," complained Mason, his voice rising, "but without his lingo we couldn't make him understand. He's seen what a mess we've made of the surface-vein here and thought there'd be the same upheaval there."

"Naturally?" prompted Sam.

Mason was reluctant, but after a while he gave in with, "Well, I guess so. It was natural. He's no miner or metallurgical engineer."

Sam leaned forward in his seat. "Now can I tell Mithra that the metal will be taken without disturbing one stone or slate within his village, and that after it is done you will leave him fine passages and underground rooms which his people can use for storage?"

"You bet!" The other became amiable suddenly. "We'd even trim up the walls for them."

"Good. I'll go and tell him. I think it'll satisfy him—in fact I'm sure of it."

"Let's hope so." Mason's chair came forward as he sat up. "But there's still one snag."

"What's that?"

"Three of my men died, and don't you forget it! What is Mithra going to do about that?"

Sam rose to his feet in readiness to leave. Now that his mission seemed to be getting some place, he felt tired, thoroughly tired and weary. Too much long distance marching and too little sleep. Six days to get back at the same hurried pace and the spaceship still to catch. This life was punishing to one's dogs.

"Mithra will send you the culprits and you may punish them as you wish."

"Like heck he will," said Mason. "Unless he's nuts."

"Oh, yes, he will—on one condition."

"What condition?"

"That you send him the three who killed his men and leave him to punish them."

"You've got me there. It's even-Steven. They're dead, anyway."

"So are Mithra's men," said Sam.

Mithra made the peace, the prowling shadows vanished from the fringes near the fort, the arbalests and flame throwers were put away. No messenger went forth to bear the tidings, a fact Sam noted thoughtfully.

"I can't see what else we can call it but a miserable misunderstanding," said Sam to Mason as he made ready to leave the village. "It's not for me to place the blame, but I reckon it'd be wiser if you gave one of your guys time off to learn the language. When people on Earth can't always make themselves understood, what hopes have you got semaphoring at a Greenie?"

"I'll see what can be done," promised Mason. "And thanks a lot!" He frowned suddenly, and added, "If you meet that Father Rooney, stall him off for me, will you?"

"I will," agreed Sam, smiling. He hiked his satchel and left.

The same native who'd brought him was his guide on the way back, but the remainder of his bodyguard had increased in number from three to twelve. He was greatly honored, for this was the escort of a Voice. Politeness still demanded that he follow his guide and pretend not to notice the others.

Twelve protecting shadows stayed with him the full length of his journey home and duly circled his cabin before fading away into the heat-haze and the half-light. They'd been phantoms throughout the trip and like phantoms they disappeared.

It was good to be back in the shack, to see the old, familiar fragment of glade through the window, to hear the regular *put-put-put* of moisture falling onto the roof, to have books biding his perusal, a bed waiting for his body.

Morning found him frantically energetic. From Mithra's land he'd plucked a new herb which looked like heather but smelled and tasted like mint. It hadn't wilted during the journey. He sand-dried it, sketched it, photographed it, packed it in a box which he tagged: *erica mithrii.* There were four new roots with which to deal, in addition to the other roots and samples of bark still waiting attention. And a report to write about every one of them. He was still busy in the middle of it when a heavy metallic rattle and the deep roar of a Diesel engine brought him outside. He was just in time to see the caterpillar from Base rumble into the glade. There were four men aboard. The machine was two days early and much of his stuff wasn't ready for it; he stood and watched its approach with mixed feelings.

With a final burst of power that sent curls of thick blue smoke through the grasses and the herbs, the huge machine stopped before his door and its passengers climbed out. The treads had left two enormous weals across the glade to between the farther trees.

He recognized none of the four. The first of these, making no remark, handed him a bunch of mail and strolled into the cabin, the others following. Sam entered last, shuffling his mail and feeling ireful.

Inside, he found the first entrant squatting on the edge of his bed; a beefy personage with a thick neck, a florid complexion, and an elusive touch of humor playing around his heavy jowls.

Without preamble, this one said, "Brother Gleeson, you're fired."

Sam tossed the mail unopened onto his bed, seated himself carefully on a sample box. "I've been expecting it."

"So have I," informed the other cheerfully. "I've been trying for months to persuade the Institute to shake you off."

"Indeed?" Sam wrinkled his eyes as he studied the speaker. "Why? What have I done to you?"

"You got me bothered by making me realize how much I've yet to learn." He jerked a brawny thumb to indicate the spectacled, apprehen-

sive young man at his side. "Same with him. He's Jud Hancock, your successor, and he feels apologetic about it."

"All right," said Sam, listlessly. "Guess this is where I pack up and go home."

"Oh, no, you don't!" He leaned forward, rested thick arms on thicker knees. "Earth's decided that now's the time to appoint a Venusian Consul and get things better organized. I have been honored with the task, and I think it's a tough one. What I'm going to need, real bad, will be an adviser on native affairs. That's where you come in."

Sam said, quickly, "What makes you think that?"

"Your reports. I've read 'em all."

"Who are you?"

"Walt Kayser," answered the other.

A wave of embarrassment came over Sam, and he murmured, "You expect *me* to advise *you?*"

"Most certainly! Where the devil can I get advice except from the right people? Who understands Venusians better than you?" He looked up questioningly, his eyes keen and sharp. "For instance, what's all this stuff you've got about what you call 'Venusian auto-rapport'?"

"I don't quite know even now," Sam replied. His hair was standing up and his goatee lying down, and his mind was in a confused whirl. "All I've found out is that as long as things go smoothly for them the Greenies are individuals exactly as we are. But when involved in difficulties great enough to cause mental stress they appear to become part of a communal mind. Immediately a Greenie is in trouble the whole world of Greenies knows about it, discusses it, analyzes it, advises him what to do in some queer mental way, and, if necessary, comes to his aid."

"Telepathy?"

"No, it's definitely not that. It isn't deliberate. It's quite involuntary and automatic and operates only under strain. It's just a peculiar faculty unknown on Earth or Mars." Enthusiasm for his subject crept into his voice. "You know, it means we've got to be almighty careful in our dealings with them. Here, one sucker means a whole world warned. Venus is the wrong place for pulling fast ones. The only way in which we can let them know we're good is by being good all the time. We've got to maintain a code of ethics out of stern necessity."

"Or else?"

"Else they're likely to be tough—maybe too tough for us to handle. It's going to be a long, long time before we get the full measure of their capabilities!" His features grew reminiscent, thoughtful. "Sometimes I find myself quite unable to decide whether the Greenies are genuine individuals or merely independent fragments of some huge, incomprehensible, planet-covering Greenie entity. There are times when they show strange aspects of both. Occasionally I think of them not as a race, but as a being, a sort of timid tiger.

It's polite and retiring—and it's wisest to let it stay that way."

"You see!" said Walter Kayser.

"See what?"

Kayser turned to his three companions and said, humorously, "He says, 'See what?' He can't hear himself talk!" He turned back to Sam. "The man who's playmate of a timid tiger is the man I need. What, in your opinion, is our most urgent requirement in creating wider and better contact with the Greenies?"

"Linguists," Sam told him emphatically. He stood up. "That's the only way in which I've gotten to know them."

"The only way?" queried Kayser, lifting an eyebrow.

"Sure!" Sam moved restlessly across the room, the others watching. The swift march of events was still a little too much for his orderly mind. What to do for the best? Wasn't Kayser weighing his friendship with natives a little too heavily? Darn it, all he'd done was learn to talk their own lingo. Any fool could do that if he took the trouble. His preoccupied gaze went through the window, saw a Greenie waiting patiently outside.

"Pardon me," he said to the quartet, opened the door, and went out.

The native leaned on his blowpipe, looked at Sam with great yellow eyes that were grave and brooding. "The Gray Chanter," he said.

"What of him? Is he sick?"

The other nodded. "They say he forbids us to summon you, but it is not good for him to struggle alone. He has spoken gently, saying that we are company enough. Alas, he cannot grasp the mind of his people."

Sam blinked and said, "Wait!"

Returning to the cabin, he snatched up his satchel, slung it over his shoulder. "Father Rooney is ill," he told his surprised visitors. "Unfortunately, you could never cross the ravines and rope bridges in that caterpillar. So this is where I go." With that, he was gone.

The dumfounded four crowded the cabin door and watched him vanish through the trees behind his swiftly loping guide. The last branches rustled behind him, the leaves dripped down and all was silence. Then, suddenly, a dozen stealthy shapes, blowguns in hand, flitted from the trees and entered the invisible path Sam had taken.

"Hey, look at that!" breathed Hancock, grabbing Kayser's arm.

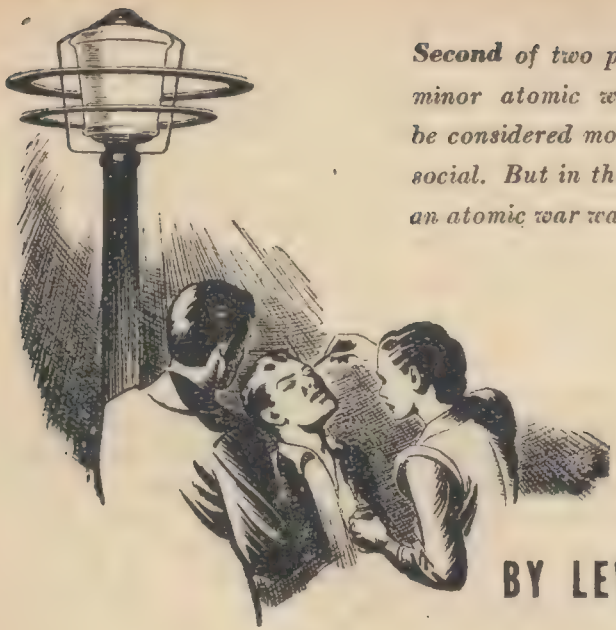
"His escort," murmured Kayser. He shrugged broad shoulders. "And I don't rate one better! Sixty miles—just like that!" He mused a lot, "There was a remark in one of his reports that caused effervescence in my thinkery. He said, 'They've been kind to me.'"

"Humph!" contributed Hancock, looking comforted.

"He didn't take up your offer," one of the others pointed out.

"He will, he will," asserted Kayser positively. "He's constitutionally incapable of refusing."

THE END.



***Second** of two parts. Setting off a minor atomic war would normally be considered more than mildly anti-social. But in the world of the GPC, an atomic war was better than peace!*

BY LEWIS PADGETT

TOMORROW AND TOMORROW

Illustrated by Orban

Joseph Breden knew it was a dream when he shot his co-guardian, Carolyn Kohl, through the head. It was a recurrent dream. And it wasn't a safe dream to have, when you were one of the nuclear physicists chosen to be a guardian at Uranium Pile Number One, the key-spot of a civilization that existed a hundred years after Hiroshima.

There was more to the dream—the nightmare sensation of going down into the very heart of the great sunken ziggurat under the Pacific island, and removing the boron dampers so that the atomic pile approached—and reached!—critical mass.

Breden was off beam, and knew it, and knew that the next psych check would betray him to the medical board. Then he'd lose his job, because the guardians at the island had to be perfectly balanced psychologically. His job was vital to him, partly because of Margaret, his wife; partly because of his brother Louis. Louis was one of the mu-

taunts born after atomic blasts—there were a number of these. They weren't supermen. They were merely humans extended.

Still, GPC—Global Peace Commission—ruled the world. After World War II, World War III started—abortively. While it lasted, blind, insane fury raved across the earth. The nations suddenly felt panic. Only in GPC was there any chance of safety—so GPC was able to take over and to rule for a hundred years.

It ruled and kept atomic power under control by maintaining the status quo. *Research had to be licensed—as Louis Breden, a bacteriologist, had learned, rather to his regret. He liked research. But GPC said no.*

Troubled, Joseph Breden went to New York to see Louis. He had managed to evade the psychological traps of Dr. Hoag, chief medic at Uranium Pile Number One; but he had not evaded his own worry. Louis couldn't help. He talked about new social movements like the Neoculturalists, who wanted interplanetary travel—banned by GPC—and that was all. Breden looked up Sam Springfield, his old G. P. doctor.

He told Springfield about his recurrent dream. The doctor made exhaustive tests, and advised Breden to go to his own medics at the uranium base. And—

Something happened.

Suddenly Springfield was dead. The nurse suggested angina. Breden faced a stone wall again.

(In an underground hideout were a man and a monster. The man's name was Ortega; the monster was his son, a mutant—called the Freak. Most of the time the Freak was sane. But not all the time.)

Breden saw his friend Mike de Anza, physicist, and asked questions about unconscious mutation. What he thought was: "Am I a mutant without knowing it? Was that what Dr. Springfield was trying to tell me? Did I kill Springfield? The nurse—Springfield's nurse—there was something funny there. What was it?"

He remembered. While he was in Springfield's office, there had been a substitution of nurses. It was the first clue he had found.

(Ortega said on the televisor, "I know you had to kill Springfield. But now Breden's conscious mind is suspicious. You've got to tell him the truth. Satisfy him. Then erase that part of his memory—using his Control.)

So the nurse, who wasn't really a nurse, saw Breden in her apartment and told him the truth.

"I'm Ilsa Carter," she said. "I'm a member of an underground organization dedicated to overthrowing GPC. We've been using you because you're the only man who can help us at this time. You're in the right position and you're psychologically amenable to our treatment. The world's in cataleptic stupor now. Stasis. Status quo. *World War III was merely a gesture; it was too abortive. What we want is to make World War III come—now."*

He wasn't conditioned to this.

Her words sounded obscene. All he could think of was his wife, Margaret, and their unborn child. Until now he had felt that their child would be born into a safe world. But—

Ilsa talked about the Freak, and his peculiar power—perhaps prescience. The Freak could see into another world, perhaps a future world. A world Ilsa called Omega. In that world, World War III had run its destined course—and had become Utopian.

"We've been conditioning your unconscious," Ilsa said, "through those recurrent dreams. Now we must convince your conscious mind that we're right. You must detonate the uranium pile. But first —well, you've got to go back to your job and avoid rousing suspicion. I've told you enough to answer your questions. Now your Control will erase this memory for a while."

Breden saw his wife's face appear on the televisor screen.

"Yes," she said. "I'm your Control. I'm a member of the organization. Because research is forbidden in this world, and I don't want our child to have cancer—as I have."

He felt the shock of that knowledge before the hypnosis blanked him out.

(Ortega was building a mechanism, under the Freak's directions. This was a completely new development. A voice suddenly spoke in English through the machine. "—trying to reach you . . . we have atomic power . . . we can help you—"

The Freak said, "I can't see . . . yes, I can see Omega now . . . or no, it isn't—"

The voice from Omega roared: "—atomic power—"

The Freak screamed: "Where the earth should be—white, white, blazing—like a sun—it was the chain reaction, it must have been—"

"—help you release atomic power—"

"IT WAS THE EARTH ONCE! IT WAS THE EARTH!"

PART II

The face on the televisor screen was fat and placid. It was also semi-Oriental. Philip Jeng's father had been a Tibetan, and he had probably inherited a touch of Himalayan serenity along with a mind as tortuous as the Cretan labyrinth. He was a big, globular man, whose particular field was logic, though he did not specialize much these days. As a member of the organization, he devoted himself to odd jobs, and to working out the complicated probabilities of the various plans that were suggested. He had a smattering of knowledge in many fields, and now he was talking psychiatary to Ilsa Carter.

"I got there as fast as I could," he said. "When Ortega didn't answer any visor calls, we figured GPC had detected the hideout. I went there with an expendable member and sent him in. But it wasn't GPC. Things have got completely out of control, Ilsa."

The woman turned from the screen to glance at the two motion-

less figures sitting across the room. She said, "Integrate this, Jeng. You got my report on Michael De Anza and Louis Breden?"

"I got it."

"They came to my apartment five hours ago. They weren't too suspicious, but they figured something was wrong with Joseph Breden. They'd found out he visited Dr. Springfield, and that Springfield was dead. They want to know all about it. I didn't dare tell them. I fed them the new anaesthetic—you know?—and they're cataleptic. I've been waiting till I could get through to you or Ortega."

Jeng's small eyes blinked. "All right, Ilsa. I've cointegrated that factor. Bring the two men to Ortega's hideout."

"But they'll—"

"It's the nearest. Travel's going to be restricted for a bit. Those Neoculturalists have been talking too loudly. GPC's just banned them. The lid goes on automatically—checking of visas, no interstate commerce without passes—the regular routine. It's been three years since the last embargo of that sort. And it's too bad it had to happen right now. The Neoculturalists are perfectly harmless to GPC, but I suppose the membership was getting too large. If GPC only knew it, those useless groups make fine safety valves for the malcontents."

"If there's an embargo, I can't transport them under anaesthesia, even to Ortega's."

"I've just sent you faked identification. Use Plan Sub-Fourteen-Five. Remember?"

"Oh, the . . . all right. But what's happened to Ortega?"

Jeng said, "I don't know, exactly. I'm trying to smuggle in one of our technicians to find out. But it's going to be difficult. There aren't any near enough. And we can't run risks at this point. Ilsa, when I reached the hideout, I found Ortega hysterical, the Freak in stupor, and some sort of gadget rigged up and talking. It's one-way communication. The man, whoever he is, can talk to us, but we can't talk to him. I think he's talking from Omega."

"But . . . Jeng, what's *happened?*"

"As nearly as I could figure out," Jeng said carefully, "Ortega built the machine, though I don't know how, since he's no technician. Probably the Freak dictated it. Then something happened. Ortega had a mental explosion and attacked the Freak."

"His son?"

"It's a familiar pattern," Jeng said. "I won't go into subconscious motives. Ortega had a temporary aberration, brought on by strain and shock. I've given him sedatives, but I'm worried about him. He isn't insane, though. It's temporary. Only . . . well, the Freak had a shock too, I suppose when his father attacked him. He's gone into some sort of protective stupor. He won't talk or listen or open his eyes. And that mechanism keeps yelling at us—"

"What does it say?"

"It wants us to finish the machine. But it can't tell us how. Apparently it's had only fragmentary glimpses of our world, and there aren't

enough common denominators. There are words we don't understand—scientific terminology. I gather it's been communicating through the Freak, and now it can't."

Ilsa said, "It's a new factor. You're in charge now, Jeng, aren't you?"

"I suppose so," he said. "I'm not a man of action. I just work out things. On paper. But now—well, I'll do the best I can."

"What about Joseph Breden . . . tomorrow?"

"Oh . . . I'll have him picked up. That'll be difficult."

"Do it through his Control."

"Good idea. As soon as you get the stuff, bring De Anza and Louis Breden here. The plan's risky, but—"

"There'll be the guards."

The fat cheeks quivered as Jeng shook his head.

"I hope you make it, Ilsa," he said. "We can't afford to lose you, too."

When the plastic disks came, she went to the window and looked out. The two killers were across the street, waiting. They would follow her all the way now, their weapons ready. If trouble developed, they would kill. Ilsa, and De Anza and Louis, and then themselves. No one could be left alive to talk. There would be suspicion on the part of GPC, but no certainty, and a subsidiary plan, involving misdirection, would instantly go into operation. But that would all be very risky, and, the way things were going now, the slightest error could, conceivably, spoil everything.

She examined the two figures sitting rigidly upright in their chairs. Then she moved about the room, straightening, checking. She studied her memory of the apartment as it had looked at the moment the men had been anaesthetized. There must be no false notes. They would waken with no knowledge that time had passed.

Their watches—that would be awkward. Presently she lifted De Anza's wrist and moved his watch's hands ahead to the correct time, leaving Louis Breden's as it was. Then she went back to her chair, placing the plastic disks in a drawer beside her, and touched a concealed stud. It was a light switch. She flickered it on and off, with regular pauses, several times. This time it was unnecessary to hold her breath. The neutralizing gas, odorless and tasteless, flooded the room.

The men stirred. Louis, finishing a sentence, said, "—must have made some notes."

Irrationally she felt panic. She had forgotten what Louis had been talking about five hours ago. She studied her hands, telling herself: *It's easy to get out of this one—quite easy. A dozen ways—*

De Anza was looking past her shoulder. Did he see something amiss? Had something changed during the five-hour period? *Distract his attention!*

She reached toward the table beside her, changed her mind, looked at Louis, and drew her arm back. It knocked over a flower vase on

the table. Water spouted on her slacks.

The material was waterproof, but chivalry was an old habit. By the time the two men had finished making repairs, De Anza's attention had been successfully distracted, and Louis had begun talking with a clearer antecedent.

The televisor sounded. On the screen a face began to appear. It was a man everyone in the world had heard of; one of the higher members of GPC. His eyes studied the room.

"We've received word, Ilsa," he said—and his voice, too, was familiar. "Bring these men. But it must be top secret."

The screen blanked.

No one would have spotted the image as a fake, because it wasn't a fake. It was a series of photographed images of the man, taken from televisor shots, arranged in such order that the lip-movement corresponded with the voice. It was the right voice, too, but the sonic vibrations had been rearranged to create these particular words. In the organization's files were dozens of similar rigged visor-messages, ready for various emergencies; this particular one fitted Plan Sub-Fourteen-Five.

And Ilsa saw that De Anza and Louis were impressed.

She let herself smile. "That does it," she said in a different voice. "I'm sorry, but I couldn't have spoken before this. Against orders."

De Anza blinked. "But—I don't get it. What's going on? Is GPC—"

Ilsa took out the identification plastics from the drawer and tossed them across. "I'm a police member. You heard him say it was top secret. Well—it is. GPC needs you two men to do some top secret work. Are you willing?"

Both men nodded automatically. "Of course, but—we're in different fields," Louis said. "Are you sure—"

"You'll find out," Ilsa said. Her instructions carried her only as far as Ortega's hideout; from there on, it was up to Jeng. She said, "We can go now, if you're ready."

They got up, rather baffled, but conditioned to obey. The three of them took the dropper to the street. Ilsa hailed a monocab.

The two killers, she saw, were following, not too closely.

Eventually she breathed again. They were going to succeed. Under a clump of trees along the country lane she dropped belladonna in the men's eyes—surer than blindfolds—and led them the rest of the way. The camouflaged entrance opened as she neared it. And, underground, she left an expendable neutralizing the belladonna with pilocarpine, and went to find Philip Jeng.

"Well, I've got them here," she said, when he had emerged to sit with her in one of the cramped rooms, with a cigarette and a mild drink. Quarters were not spacious underground; there was too much

danger of detection. The real danger, however, lay in the possibility that GPC might sometime grow suspicious and trace a tapped power leak.

Philip Jeng sat back like the Laughing Buddha, though his expression was placidly blank. He sipped his drink in silence.

"Well?" Ilsa asked after a while.

"Oh," Jeng said. "Yes. Sorry. I'm trying to juggle several dozen things in my head at once, intangibles I can't even set down on paper. It's a little difficult to keep track of reality. Concentration does that. I'm beginning to understand how the lamas could spend their days contemplating Nirvana. I'm not really the best man for this job, Ilsa."

"You're the best one we have," she told him. "You're certainly not an expendable."

"If it comes to that, we're all expendables. Perhaps not at the moment, but when the plan goes into operation. However—De Anza and Louis Breden. They're here, eh?"

"Yes. We're understaffed, Philip. Perhaps it would be best to kill them."

"I think not. No, Ilsa, that's not moral cowardice—I know killing's necessary often enough. We bring not peace but a sword. I'm thinking of waste. Those men have valuable brains."

"Valuable to us or to GPC?"

"We've converted others. I don't want to kill them without first making certain they can't be persuaded to join us."

"I haven't got-time to argue with them," Ilsa said practically. "And it would take a lot of argument, too."

"I haven't time either—nobody here has, just now. But later when we can make time. Keep them under narcotics; that's safe. I'm thinking they might be latent malcontents, Louis Breden especially—he's a mutant, isn't he? Perhaps we could bring psychological pressure to bear. Get hold of their files, if we have access to them. But they're not important now that they're here. The big trouble is with the Freak and that machine Ortega made."

"Figured out anything yet?"

Jeng said slowly, "A little. I have no proof. I can't even use empirical logic. But my theory is that the voice that speaks to us from Ortega's machine is speaking from Omega—and Omega isn't the future, as we imagined."

"Another planet?"

"It's this planet. It's the Earth, the same Earth we're—*not*—standing on." His placidity dissolved into a faint smile.

Ilsa stared.

"It's the Earth that might have been," he said. "And to the people of Omega . . . *this*"—he tapped his foot—"this is the Earth that might have been. It's a probability variant. It's the Earth that took a different route from ours, made a different decision, at a crossroads long ago. I know this: in Omega, according to that voice, there was a World War III, and it wasn't abortive like ours. I haven't talked to that voice, not yet; but it's talked to me. I'm correlating and integrat-

ing. The most important thing I've learned so far is that atomic power isn't as dangerous as we've been conditioned to believe. No chain reaction could destroy this planet. So we can expand our plans. At worst, we'll blow a big hole in things—but that's all."

There was a voice in Louis Breden's head. It didn't make sense. He ignored it. He was busy fighting.

De Anza was already unconscious; they had managed to stick the hypodermic needle in him. But Louis kept on fighting, in spite of the odds. He knew this outbreak had been a mistake, but when De Anza had started it, with a roundhouse swing at one of the guards, there was nothing to do but ride along.

Louis had to keep his distance from the four men. At close quarters their needles were dangerous. He danced back, searching for a weapon, and saw a door in the wall open. Ilsa Carter stood there. A huge, sleepy-eyed Oriental was behind her.

His momentary distraction was an error. The men closed in; he struck out, and at the same moment he felt

the prick of the needle. Instantly faces wavered and swam like water. His muscles dissolved. He was riding down an elevator—

But in his mind was a new cool, keen clarity. That voice came back, bringing pictures with it. It was screaming in panic.

"Tell them . . . must tell them. . . . IT WAS THE EARTH ONCE! THE CHAIN REACTION—"

Then the narcotic drowned his senses.

The moment a man is born—in fact, the moment he is conceived—he is at war. Metabolism fights catabolism; his mind is a battlefield; there is a perpetual struggle with orientation and adjustment to the arbitrary norm. Some men adjust fairly well to their environment, but no man is ever entirely at peace. Death brings the only armistice.

But for Joseph Breden there was a brief truce that night. It was not a solution, except purely temporarily; the hypnotic treatment would eventually have worn off. It could have been renewed, but that would have been a negative triumph, the triumph of passivity. To forget problems is not to solve them, or alcohol and narcotics would be more often prescribed.

He had made a truce. His memory was not gone; there was only a selective amnesia. He could not remember Ilsa Carter, or the circumstances of his investigation that afternoon. He had even forgotten the recurrent dreams. But little else had been forgotten. There was still his faint dissatisfaction, focused, somehow, on Louis, but even that didn't seem so rankling now. A well in his mind brimmed Lethe, and it overflowed a little, giving Joseph Breden, on his night of truce, a peace he had not known since childhood.

The routine checking-in psych tests had been passed without trouble. He sat with Carolyn Kohl at the chessboards, ignoring the visio-recorders focused on him as he ignored the monster chained beneath him in the ziggurat's heart. Perhaps he didn't completely ignore the recorders; unconsciously he felt a little warmed by the knowledge that he, one of the guardians, was being guarded, safely protected by those invisible monitors. Here, under earth and sea, in the sunken ziggurat, was the very womb of security, the truest symbol of GPC that was the world's guardian. Under his feet, chained like the Midgard Serpent, was the foundation-stone of GPS—Uranium Pile Number One.

Midgard Serpent. While he waited for Carolyn to move, he followed out that concept, very conscious, somehow, of the vast, complicated social organization that GPC controlled. What was it that had finally fettered the Snake? A chain made from rather unlikely things, like the spittle of birds—was that it? Yet the chain had been stronger than forged steel. Well, steel alone could not chain the uranium piles. Nor could boron. It had to be made of certain intangibles as well, social conscience, and a

will toward peace, and trust, and a strong, powerful technology—held always at *status quo* lest it expand and snap a link in the chain. But the Snake was fettered—this Midgard Serpent that coiled around the earth—

"Check," Carolyn said, "and you'd better concede. Our shift's nearly over."

"Wait," Breden said. He studied the boards while she rose, made a round of the instrument panels, and returned to her chair.

"Baby's still asleep," she said. "Did you move? Well, how in the world!"

"I moved, all right," Breden said maliciously, and Carolyn sadly removed her queen from the danger area. Breden put out his hand, shifted a castle, and said, "Check."

Carolyn hastily nodded toward the wall indicators. "We won't have time to finish. Here's our relief."

But Breden swung out a camera and snapped a color-photograph of the boards. "We can finish it next time," he observed.

She sniffed. "That won't be for a week. I'll find the right move by then, though."

"Consult an expert, Carrie," Breden suggested.

"I do very well on my own. Well, let's go. How's Margaret?"

"Fine. I'll be spending my furlough with her. Wait a minute; something's—"

A voice from the wall told Breden to report to M.A.

He obeyed cheerfully enough.

Dr. Hoag, the chief psychiatrist, was still smiling. He was alone in his office. "Just routine," he said. "We're not calling out the Board tonight. Here, stick your head in this gadget." He adjusted electrodes. "Now relax, have a cigarette, and we'll get this finished fast."

"What's the program now?" Breden asked.

"Word-associations will do, won't they?" Hoag touched a switch, and a wall panel lighted. A pulsating red line showed across a graph, moving as the guiding drum turned. Beside it, overlapping at times, was a blue line, an earlier encephalograph reading of Breden's brain. Hoag, perched on the edge of his desk, picked up a blue paper and examined it. "This the right one? Yes. All right. Let's go. Bread."

"Butter."

Reaction time showed on the screen. The blue and red lines overlapped. Hoag said:

"Man."

"Woman."

"Five-six-eighty-six."

"Stable lanthanum."

"Secret."

"Keep."

"Coal."

"Carrie."

So it went. Finally Hoag put down the paper and went over to remove the helmet. "Fair enough," he said. "There's some variation, but that's normal. You get about the same reactions you got six months ago from this list."

"All through?"

"Almost. This is routine. Sodium

pentothal surrogate. Not strictly necessary, but you know regulations. Roll up your sleeve. Stick your arm in the shot-box."

Breden did. Unseen by him, within the box, ultraviolet made his skin aseptic, a photoelectric found a vein, anaesthetized the area, and completed an injection.

"All right, take your arm out. Now." Hoag found another list and asked more questions. He was easily satisfied.

"That does it," he said finally. "Stick your arm in again for the antidote. I've got to rush off. There's some new candidates coming up. Can you finish up by yourself?"

Breden didn't answer. His head moved jerkily. Hoag grunted and went out, and Breden abruptly pulled his arm out of the box so that the needle missed him entirely.

One thought surged up in his brain and pounded against the threshold of consciousness. Realization hesitated on the brink. A word, a shape, a Zodiacal sign, a letter, C—

Why had he evaded the neutralizing shot? Impulse? The pentothal surrogate would wear off soon by itself, but in the meantime, under its stimulus, he might be able to capture this agonizingly evasive, vital thought—

He stood up and went out. Leaving the ziggurat was a robot-guided, automatic process. He was in the jet plane, heading for New York, before he understood the memory.

In Dr. Hoag's office the telltale mechanisms, connected with the shot-box, punched symbols in a plate and fed it into a screening device. Eventually there was on record the following message, to be integrated and investigated:

5:34 a.m. Tuesday July 7, 2051. Neutralizing surrogate for pentothal test was not administered to Guardian Joseph Breden. Shot-box Eighteen to be sent to Analytical Repairs for check on operation of mechanism.

Cancer.

That was the elusive memory. Now that he had it, the other thronging, shadowy memories came back too. They had been too transparent to see clearly before, but now they could be seen.

Alone in the robot-piloted jet plane, Breden lay back against the cushions, his eyes closed, and called up phantom after phantom of memory.

Now he knew. Now he remembered. Ilsa Carter. All of it.

But it was hard to think. The memories were fading as fast as they came. The drug was wearing off, and, with it, his memories dissolved.

Ilsa Carter—New York. She was waiting for him there. If he fell into her hands—hers, and the hands of the organization behind her—

Margaret?

But—she was his Control! It was Margaret who had hypnotized him, his own wife—

Cancer.

A bell rang. A message flashed on in the ceiling. APPROACHING NEW YORK.

Hoag—he'd have to tell Hoag. He reached for the visor, but didn't

complete the gesture. He pressed his temples hard with his palms.

What would happen to Margaret if GPC found out?

But he couldn't keep this secret. It was unthinkable.

This secret—what secret? He had to focus hard to remember. As fast as he concentrated on one factor, another slipped away. It was becoming impossible to integrate his memories. The drug was wearing off; his Control's hypnosis was returning in full strength.

He needed time.

Hastily he snatched up the visor switchboard. "Reroute me to . . . to San Francisco," he said, because it was the first place-name that came to his mind.

Then his new-found memories dissolved utterly.

It took Ilsa Carter only ten minutes to discover what had happened—in so far as she could. All she knew, of course, was that Joseph Breden had not landed at the New York airport. It wasn't difficult to ascertain that the jet plane had been rerouted to the West Coast, but it was troubling not to be able to understand why. All she could do, then, was to put in a secret, coded call to a San Francisco member of the underground. She issued instructions and then vised Jeng. She explained.

"Too bad," he said. "We'll keep our fingers crossed. Breden will be brought to me when he's located?"

"If that's possible. GPC's embargo still holds. The Neoculturalists are soap-boxing. Interstate transportation's going to be difficult. Still, a key man like Breden can manage it all right. We'll do our best."

"You can always use his Control," Jeng suggested. "Don't risk your own life, though, Ilsa. You're not expendable—not yet, anyway."

She said, "We've laid a false trail to cover the disappearance of De Anza and Louis Breden. Investigation will show that they rented a copter and were caught in that storm off Carolina last night and carried out to sea. Anything new on them?"

"Nothing yet. We're still too understaffed, Ilsa. We've had to keep them unconscious. As soon as there's time—and a man to spare—I want to wake 'em up and talk to them, but I've had to send most of our staff out on jobs. We've got to draw in our horns now. We were spread out more than I'd thought, so we're a little vulnerable to investigation—and GPC's investigating the Neoculturalists. The boys are covering as fast as they can. If you could come down here—I can't let just anybody handle De Anza and Louis Breden. But you're a good semanticist."

"I'll try," she said. "But remember that Joseph Breden's the big stake now."

"Right," Jeng said. "I wish I could talk to Ortega, but he's in bad shape."

"Psychopathology?"

"No. It was ordinary hysteria first, but—well, he's an old man, Ilsa. His heart isn't good. There's something wrong, and I don't know

what it is. I'm not physician enough to say. I've got one of our medicos checking on him now. In fact, here he comes. I'll see you later, Ilsa."

Jeng touched the stud and the screen blanked. He turned to the medico who had just come in.

"Well?" Jeng said.

The doctor said furiously, "If GPC hadn't outlawed research, I might be able to help Ortega. But I don't think I can, now. There's a virus that's got into his system—latent till he collapsed yesterday. It's running wild."

"What kind of virus?"

"It may have been coryza once," the medico said. "The specific for the common cold was found eighty or ninety years ago—GPC authorized *that* research, perhaps because GPC wasn't so sure of its power in those days. But in ninety years a virus can mutate. The old coryza specific's no good at all against this variant form. Coryza's evolved, that's all—and it's evolved into something deadly. At least, it's deadly without an antitoxin, and *I* haven't got an antitoxin."

Jeng said, "I knew there were germ mutations, of course, but I hadn't known about this—coryza? Is there much of it around?"

"Virus, not germ," the doctor snapped. "It's a masquerader. Adaptable as the devil. You could easily mistake it for a similar pathology—atypical pneumonia, say—and that's what's been happening. A man dies of something *like* atypical pneumonia, and his attending physician writes that down—because he's been conditioned by GPC. He may suspect the truth, but his conscious mind won't let him ask questions."

"What about Ortega?" Jeng asked. "There's no antitoxin?"

"Well, I'm working on something. I've been working on it for months. But how the devil can I accomplish much? I have to do my research in secret, and I've got to live my public life too. I just don't have the time or the facilities. I'll do what I can with Ortega, but I'm not making any prognosis. The doctor said violently, "It's only by a miracle that none of these bugs has evolved yet into a real plague."

Jeng said calmly, "Do your best. If we succeed with our plan, there'll be medical research. There'll have to be. How about the Freak?"

"That isn't even a human pathology. The Freak's in shock. He's got something like aphasia ataxic. He can't articulate words. There's no cortical lesion, apparently, but there's another factor—he can't write any more than he can talk. It's a rather rare form. Amnesic partly. The Freak's a mutant, Jeng; remember that. He can't be cured as easily as a normal pathology. But obviously he's had a shock and locked himself into his own mind. He can't communicate with us."

"But can he think rationally?"

"How do I know?" the doctor asked

The drug held Louis Breden.

But he could see the pictures and hear the silent, urgent, half-articulate voice in his mind.

"Tell them, tell them . . . always

cut off. Since I was born. Since I began to understand. This world, green fields, blue sky, never for me . . . and now paralyzed, can't write or speak . . . if they wouldn't always look away when they talk to me! . . . is Father? . . . he couldn't wipe out the words by killing me. . . . He must have wanted to kill me for years, unconsciously. . . . I've been his incubus . . . our Father Which art in heaven . . . kingdom come . . . but they don't know . . . that white shining horror in the sky . . . tell them, tell them, tell them . . . before—"

Louis Breden groaned and stirred. Dimly he felt the prick of the needle. He sank back again into deeper unconsciousness.

Jeng sat before the gadget, making notes on a pad. The great booming voice had been filtered down, by jury-rigging a transformer, but it was as clear as ever.

It said, "I don't know the trouble. I'll give you the list again." It dictated rapidly. Jeng's stylus point checked down a long list. The stylus reached the bottom and came back to one phrase.

The technician behind Jeng said, "That's the trouble. We've got no equivalent on this world."

"What is it?"

"Well—it seems to call for an electron beam deflection plate maintained at 150,000 volts with no positive connection. But it must be more than that, or it wouldn't work at all without the positive hookup."

"Can't you rig up some substitute?"

"Sure," the technician said morosely, "*if* I had a beta ray emitting radioisotope. Just give me an atomic pile and I'll deliver your isotope—but not immediately, because it takes time. On Omega they've got the technologies. They've got their uranium piles working, and stockpiles of the necessary isotopes. They must have. But we don't. We haven't got the facilities or the time. I could build a piano in the Sahara, provided I had a year to do the mining and smelting and stuff. I *could* rig a deflection plate or some substitute, but it would help if I had a graphite supply and a ceramics plant and a uranium pile and all the power I needed. And a few other things. I'm trying to play Beethoven on two keys! Still, maybe I can think of something. I doubt it, though."

"Keep trying," Jeng said, and the technician snorted and went out.

The voice from the machine said. "It would be much easier if you could talk to me. I don't know what has happened to my rapportee."

"The Freak?" Jeng asked silently.

"I can't get in touch with him. Well, let's go over the list again. You're approaching your world crisis, and unless I help you—Let's try the list. First, the basic circuit—"

More explanations.

"Got that? I think you have those materials—could it be the current? Can you hear me? I can't even be sure of that now. Perhaps I'd better try to advise

you—the trouble is, I've been out of touch with your world since yesterday. I don't know how events may have changed. GPC may have discovered Breden's tie-in. I may be talking to GPC now, if they've discovered. . . . I'll have to risk it. I can't come into your world any more than you can come into mine."

"Why not?" Jeng asked, silently again, but apparently thought processes ran similarly in Omega. The voice said:

"Did I tell you the reason for that? Varying energy potentials. Too much difference in voltage between your continuum and mine. It's a matter of entropy; in some probability universes, things happen that speed up entropy—creation of a nova can do that—and a million volts difference in potential can wipe out a planet, if it's channeled across. The same principle as lightning—leveling energy potential. The lightning can cause a good deal of damage. But this audible communication is possible without channeling. It's simply a matter of resonance, finding the tonic—the purpose of the instrument I had you build. When you've finished the transmitter, it will be tuned to my receiver here, and the vibratory principle will do the rest. But the Freak was my first contact, Ortega—"

The voice stopped. Jeng's great body surged forward, as though by mere physical effort he could somehow break through the barriers stronger than time or space.

"Ortega," the voice repeated. "Is this Ortega? Are *you* Ortega?"

And then, after another, longer pause:

"I said that for all I knew I might be talking to GPC, but I suppose unconsciously I assumed that that hadn't happened. Now I've realized more clearly. . . . I explained all this once, carefully, when I first made contact through the machine. The machine Ortega made, at my instructions, transmitted by the Freak. But I don't know what's happened on your world since then. Something must have happened, or the Freak wouldn't be out of rapport. There are two main possibilities. One, that I'm talking to GPC; second, that I'm talking to another member of Ortega's underground organization.

"In the first case, my words can't make matters worse than they've become already, and they may plant doubt in GPC's mind. Which would be something! In the second case—well, I'm trying to help you, as I tried to help Ortega. I'll repeat what I told him, then. Listen carefully."

Jeng made sure that a recorder was switched on.

"I am John Van Buren, a descendant of President Van Buren—"

John Van Buren summarized the story of Omega—whose history was the history of Jeng's own probability world up to the crossroads, sometime in 1946, over a hundred years ago.

Translated to newspaper head-

lines, it could be summarized thus:

August 11, 1945:
IT'S OFFICIAL: JAPS GIVE UP!
BEDLAM BUSTS LOOSE AT 7 PLUS 1 AS CITY BUILDS BIGGEST HANGOVER
CONGRESS CALLED SEPTEMBER 5 TO START SHIFT TO PEACE

August 20, 1945:
JAP ENVOYS' QUIZ RESUMED
FORMER POWERS MODEL DIES IN 11-STORY PLUNGE
GIRL STRIPPED, SLAIN IN JERSEY
CUBS WIN 2 FROM GIANTS; DODGERS, YANKEES SPLIT
RUPTURED? STOP WORRY WITH THIS AMAZING INVENTION (Advt.)

February 5, 1946.
U. N. CONFERENCE STALLED

March 12, 1946:
RUSSIA, POLAND WITHDRAW FROM U. N.

July 20, 1946:
BLACK MARKET CRISIS BEFORE CONGRESS
RUPTURED? STOP WORRY WITH THIS AMAZING INVENTION (Advt.)

August 3, 1946:
LABOR UNREST RISES
LYNCHINGS IN MISSOURI AND CALIFORNIA

September 10, 1946:
ATTEMPT TO REVIVE UNITED NATIONS

March 5, 1947:
GERMANY DEMANDS REPARATIONS LOWERED

September 29, 1948:
RIOTS IN AFRICAN COLONIES

July 5, 1949:
REVIVED U. N. DEMANDS NATIONS DISARM

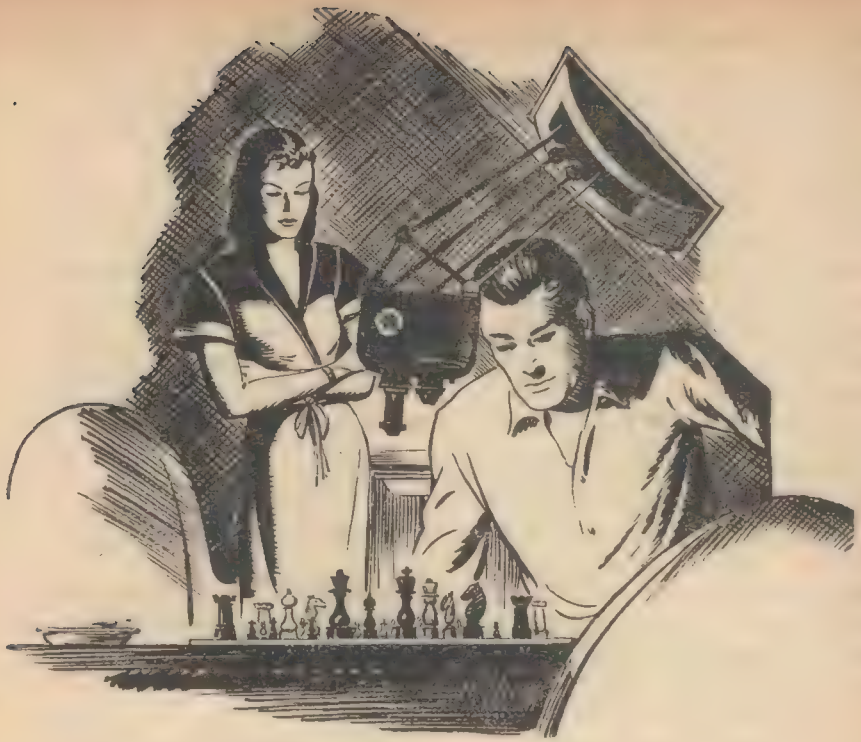
June 29, 1950:
STOCKS RISE SHARPLY
RUPTURED? STOP WORRY WITH THIS AMAZING INVENTION (Advt.)

June 30, 1950:
U. S. AT WAR!
ATOM BOMBS BLAST CITIES
MacARTHUR DIRECTS COUNTERATTACK

July 10, 1950:
ALL CITIES EVACUATED

August 12, 1950:
GERM WARFARE BEGINS

John Van Buren said, "I suppose the main answer came when our world, as a whole, realized that there were two parts to freedom—first, freedom *from*, and, after that, freedom *to*. If we hadn't had the second point to consider, the anarchy would have continued indefinitely. A drastic cure—but the world was sick and insane after 1945. Consider all the chances we've had. And yet there was the same amount of political corruption, the same social and racial antagonisms, the same grab-and-to-hell-with-the-other-guy spirit. You can find plenty of places to put the blame—England's policy in India



and Palestine, Russia's secrecy, China's civil wars—and the United States couldn't cast stones, of course. Outside of a few countries like Sweden, we were the only democracy on earth, but all we had was freedom from, not freedom to. We were groping like everyone else, and so eventually World War III started, and wasn't abortive like yours.

"Who started it? An atomic bomb dropped. *That* started it. And then the cities were evacuated, and there was decentralization. And the way to fight them was with biological weapons. So the plagues came. There was something called the New Bubonic, for example. We perfected that. We immunized ourselves and spread the germs, and *they* spread —and then they mutated and attacked us. Eventually there had to be peace. After the population was decimated.

"We forged a sword, and it turned in our hand and struck us. For ten years after the undeclared armistice everyone worked with one goal; it was a war to conquer the little, mutated bugs before they killed us all. In the end we won. And by then we'd found some new

ideas—notably a method of increasing the life span.

"I'm ninety-four years old and in the prime of life. I'll live to be two hundred or more. My brain won't fail until I'm within a decade of that mark. Till then, I'll be assimilating knowledge, learning, utilizing what I know—and applying it. Perhaps that's why I was able to get in contact with your world in the first place. I had knowledge and time enough to use it. Your race starts to decay before you're seventy.

"We haven't a Utopia. We don't want one. But we're prolonging our life span all the time, and we're beginning—only beginning. Our ships go to the stars! If there's another war, it may decimate us again, but it won't destroy us. We're not a perfect planet. There are still diseases. But there are none of the old diseases that existed a hundred years ago. We found specifics for them. New mutations keep arising, but we can hold those in check; our research laboratories are as efficient as we can make them. Medicine is one of the most honored sciences on our planet. Funds for it are available always. I don't know if it happened on your world, but it did on ours—a hundred years ago Congress refused to grant a million dollar fund for cancer research, though there was evidence even then that with such resources cancer could be cured.

"After what Congress had already spent!

"We're not perfect by any means. But we're a lot better off than you are. Your world is in a psychopathic state. You've been in the straitjacket of GPC since 1950. It's retarded adolescence. Only your organization had sense enough to realize that and to do something about it.

"I was working on telepathic research. That was how I reached the Freak. It took me three years to get in close enough contact to make him understand, and that happened only a few days ago. But all the while I was tapping his brain, getting through him a picture of your world—and filtering it out from his imaginary pictures.

"I tell you: GPC must be destroyed, or your world will die. I'll do what I can for you. But if you expect me to tell you how to build a death ray, you expect too much. It wouldn't work. A machine like this communicator, based on resonance, will work in both our worlds, but remember the main point: for a hundred years or so we've moved along different probability lines, and our entropic rate has been different. The energy potential of your continuum is different from ours, billions of votes apart. We have had to change many of our ancient equations—even the Einsteinian mass-energy formula has variations now. But, as I say, it's possible to build a machine that will produce certain vibrations in our world—and when you do that, I can hear your voice.

"As for the Freak—I don't know.

frankly, why I can touch his mind. He can perceive probabilities. He needs no machine to do that; his mind is all the colloid machine necessary. It was a latent talent born in him. He was a mutant. And rather an improbable one himself. We still don't know too much about the laws of probability; the Heisenberg uncertainty factor enters into it, and when we get down to atomics and working with the genes themselves—we simply don't know all the answers. Perhaps probabilities shifted when the Freak was born. Perhaps he's a crossroads himself. It was improbable that he should ever have been conceived, and at a locus of probabilities the illogical may happen. At any rate, he can perceive probabilities."

"Not prescience, then," Jeng said to himself. "But according to Ortega's records, his visions didn't always check with Van Buren's world—and Van Buren mentions the Freak's 'imaginary pictures.' Other lines of probability? Or—after all—prescience?"

The voice from Omega went on.

"One thing: the atomic blast isn't as dangerous as you have imagined. Don't worry about the earth exploding. It won't. And as long as the planet itself survives, mankind and civilization will survive. You may have to take a long step back in order to go forward, but we did that—and perhaps our main success was in escaping from the old bugbears that held man back for hundreds of thousands of years. Almost at any time after the industrial revolution ailments like early senility and the diseases—cardiac, for example—could have been conquered, if a genuine attempt had been made. But it never was made. Habit patterns of our ancient social culture held us back. Not until 1958 was there any real investigation of cerebral infarcts. That was the first step toward conquering early senility—studying the tiny progressive hemorrhages within the brain. Alvarez had studied it before then, but he said it was apparently incurable. We've cured it.

"Remember, before you can get freedom *to* you must get freedom *from*. That's where the rank and file usually break down. Back in the days after World War Two it was commonly accepted that technology had advanced tremendously, and that a fraction of the money spent on the war, had it been devoted to research, would have paid off. But—it would have been a precedent. Congress hesitated, and everyone hesitated.

"Atomic research had been merely sporadic before 1941—but a precedent was made then, because the nations had to do research or die.

"Your world faces death now. You must get your freedom from GPC. You're trying to plug a dyke that's leaking at a thousand points.

"Smash the dyke. Follow your plan. Get Breden to explode the uranium pile.

"That will wreck GPC. It may wreck mankind a little, too. But man will survive. GPC won't. Your first and vital step is to

destroy Uranium Pile Number One. Until you do that, you're doomed to fail. The uranium piles are the psychological foundation stones that keep GPC in power. Once the symbol goes—the reality can be attacked."

The voice stopped. Jeng was silent, placidly watching the machine before him, his sharp brain trying to integrate what he had just heard with the incredibly complicated possibilities already filed in his mind. The organization of the world was not simple. And the problematical factors, the variant possibilities, added infinite complications.

He put up his hand and rubbed his forehead gently. He had a slight, dull headache. He felt unreasonable irritation. There could be machines to do this integrating; such machines were quite within the realms of engineering possibility. But, of course, such machines could not be built under GPC.

So his brain would have to serve as such a machine. And, being human—and not being a hundred years old, with all the knowledge and training that age implied—Jeng knew that he was fallible. One lapse of memory might mean complete failure.

Nor could he delegate power to subordinates. He hadn't enough capable men available, with GPC's new embargo limiting transportation. The organization was lamed, half crippled. But it had to stumble on somehow. If it could only reach the immediate goal—Breden, Uranium Pile Number One, the atomic blast—then the balance would shift from failure toward success.

Had Ilsa's San Francisco man located Joseph Breden yet?

He had not. Breden hadn't reached San Francisco.

From a jet plane, traveling at sonic speeds, one does little sightseeing, and Breden didn't know he was bound for the West Coast until the telltale flashed upon the ceiling. He had only the vaguest memory of redirecting the plane from New York, and no memory at all of why he had done so. Realizing that it might be difficult to secure an immediate return reservation from San Francisco, now that he was on furlough time—he had spent the last half hour listening to the newscast, and had learned of the Neoculturalist investigation and the interstate embargo—he picked up the visor mike and demanded a rerouting to Denver. The jet plane made a gigantic curve and rose as it turned its nose from west to east.

So he landed at the Denver port, while Ilsa Carter's San Francisco expendable was waiting for the quarry that didn't arrive. He located a copter and set its controls, using the visor to call his wife. But Margaret didn't answer; the automatic butler said she'd be in shortly.

He sat back and tried to analyze the slight confusion in his mind. That complete relaxation of last night had not returned. There was a vague, disturbing sense of some-

thing wrong, something forgotten, too obscure to be analyzable. But he thought it was somehow connected with Margaret.

A symbol, a word, a sign—what?

He dismissed it, or tried to, and looked forward to a week's relaxation in Margaret's company. The prospect was a pleasant one.

And it was pleasant—up to the period when he looked into Margaret's eyes and felt his senses blank out.

He made the return trip by stages, under posthypnotic control. Afterward there were flashes of memory—finding himself in Missouri, Ohio, Pennsylvania, knowing the vital urgency of arranging another stage in the journey and the equal urgency of communicating with Margaret by visor.

Each stage was a unit in itself, beyond which he could not look or think. And eventually, under hypnosis and the personal guidance of an expendable, he reached the hideout.

What happened after that was vague and strange.

He remained passive. He was not called upon to do anything, except listen, learn, and understand. The time for decision was not yet. Like a man in a dream—which he was—he allowed himself to be led through the underground rooms and corridors and laboratories, listening, watching, not questioning anything, though much of what he saw had come to this world from Omega and was unlike anything he had ever known before.

The hypnotic control played him like a delicate instrument, lessening and increasing the intensity as it was needed. His stolen memories returned—memories of what Ilsa Carter had told him in her apartment, and the meaning of the Zodiacal symbol— He remained a witness, while all around him a flurry of high-tension activity went on.

There was no attempt to keep any further secrets from him. On the contrary, Jeng and the others made every effort to acquaint him with the whole history, aim and purpose of the underground organization. With Jeng, he listened to the playbacks of the voice from Omega. With Ilsa Carter, he watched De Anza and Louis being given the sedative shots. He saw the Freak, motionless as a monstrous image in his tank.

Meanwhile the man from Omega spoke further, and Breden listened to that, too.

In a way, it was rather pleasant. All responsibility was taken from him. He was fed, clothed, housed; he had only to watch and listen. He watched as an abstract critic, so that it was only abstractedly that what he learned conflicted with his psychic conditioning. But though he did not know it, the forces within him were unconsciously building up to the decision he would eventually have to make.

And when the opportunity came, habit made him react as he did.

Jeng, in his endless integrations,

had forgotten one factor. Joseph Breden was not an ordinary man. The organization had searched for a long time before they found the one individual who fitted their needs by virtue of his psychological background and his social position. There had been other possibilities, eventually discarded, who were guardians connected with the uranium piles, and who would be malleable to psych-pressure.

But only Breden, it seemed, had combined another factor: something not quite analyzable, a certain latent positivism—*je ne sais quois,* in fact, which had almost eluded the organization's s k i l l f u l, trained searchers. The basis of their report could be divided into three parts:

1) Joseph Breden had access to Uranium Pile Number One

2) Joseph Breden was vulnerable to psychological pressure

3) Joseph Breden could become very active indeed, once he had made a decision.

Slowly, as the days passed, Breden began to realize that a spark had kindled in his mind. He thought it had always been there, deep down. But now it was being fanned brighter, and its glow was strangely reassuring. As he sat before the televisor, waiting for the face of his Control—Margaret's face—to checker in, the strange, small, cold spark grew brighter in his mind.

He became conscious that a synapse existed—that the spark was an extension of himself. So might a man who had never opened his eyes be conscious of gradations of light striking through his lids. He tested the extension a little. He found he could bridge the synapse.

Three times he hauled himself out of the passive depths of hypnosis, only to let himself drop back into it, for this was not yet the time.

Meanwhile he waited and listened, while curious things happened in his brain.

GPC's embargo clamped down harder and harder. The Neo-culturalists, who had been harmless fanatics until now, stirred into rebellion under pressure. Had that been GPC's motive all along—or did their suspicions strike deeper, closer to home? Jeng didn't know; Ilsa didn't know; all they knew was that the constriction drew tighter, and the skeleton staff of the hide-out diminished.

Too many members of the organization had to play their public lives in detail, not daring to steal time to follow Jeng's orders. So the brunt fell on others, and one day the hideout was badly undermanned.

Breden was drowsing somnambulistically on a couch when Ilsa came in.

"Follow me, Joe," she said. "Stand up and follow me. We're getting another message from Omega."

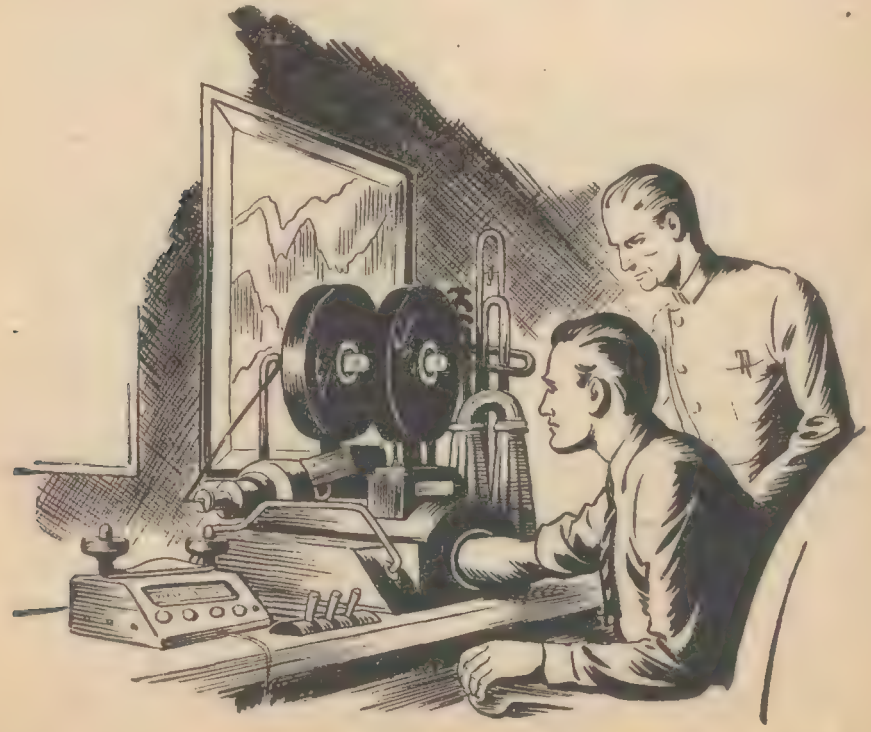
He rose slowly. And then his mind made contact with the bright spark. His arm brushed the little rod-weapon that Ilsa carried at her belt and tore it from its clasp. It tinkled to the floor. The girl jerked

back, looking at him, but Breden stood motionless, staring blankly, waiting.

Ilsa bent to recover the rod. Breden brought down the edge of his palm across her nape. She fell soundlessly, cushioned by Breden's out-thrust leg. He picked her up, laid her on the couch, and took the weapon. He had never used it before, but that did not matter. Something far stronger than logic controlled him now—or he controlled it. There was some difficulty in deciding which was true.

He stepped toward a blank wall. He had never seen the lock system that opened the door here, but his hand moved in a quick, intricate gesture before the concealed photo-electric. The door opened. The expendable standing there confirmed his expendability by going down instantly under the impact of the silent, searing energy that leaped from the rod-weapon. Breden had never used this before, either, but he made it work.

He stepped into the next room. He went along a passage, opened another door, and took two quick steps in which proved to be exactly the right direction. The energy bolt of another guard missed him, but Breden's weapon did not miss.



Then he was alone with the drugged bodies of De Anza and his brother.

There was a cabinet in the corner. Breden opened it and let his gaze move swiftly across the rows and shelves of equipment. He reached for a bottle and took a hypodermic syringe from its sterilized case. Deftly—he had never done this before, either—he administered neutralizing shots to the two prisoners.

"Let's get out of here," he said when they had wakened.

De Anza wanted to ask questions, but Louis was silent as they retraced their steps. They recovered the weapons from the dead guards, and Breden showed his companions how the mechanism worked. He said softly, "We'd better kill Jeng first. If he escapes, it'll be unfortunate. Even GPC may have some trouble picking him up. Come on."

"What the devil's going on?" De Anza asked blankly.

"*Sh-h.* Come on."

Louis, fingering his weapon, frowned and looked under his brows at his brother. He seemed oddly puzzled. "Joe," he said softly, "this gadget—it's a killing weapon?"

"It is now. You can stun with it too, if you want."

"How?"

Impatiently, with two quick motions, Breden showed him. "Come on," he said, nodding toward the wall. They took the straight corridor that led to Jeng, and presently came out in the big room where the Freak lay motionless in his tank, and the voice from Omega spoke clearly through Ortega's gadget. Jeng and his technician were together. Breden moved his rod-weapon slightly and killed the technician.

Jeng swung round in his chair. The voice spoke on from behind him, but no one listened to it now. Jeng put his hands on his knees and looked at Joseph Breden.

"Then we've failed," he said quietly. "We didn't convince you, after all."

Breden said, "Convince me of what?"

"That what we're doing is right and necessary."

Breden said over his shoulder, "Mike, back up a little. Keep your weapon on this man Jeng. Got it? Kill him if he makes a move." Then he turned so quickly that Louis Breden's gesture was arrested abortively. "Drop your weapon, Louis," Joseph Breden said, "or I'll kill you, now."

Louis didn't obey. "Wait a minute, Joe," he said. "Will you answer a question? Do you intend to kill the Freak?"

De Anza hadn't glanced away from his quarry, but he made a puzzled interrogative sound. Breden said, "Yes, of course. But —how much did Ilsa Carter tell you?"

"Practically nothing. I learned in . . . in other ways."

"Just now you intended to knock me out. Watch Jeng, Mike."

Louis said, "Yes. You see, I . . . will you listen?"

Breden said, "I don't quite . . . I don't know whether to kill you or not. I knew the answers before. But—"

Louis said, "I've been in telepathic rapport with the Freak's mind. I know the answers myself now—more of them than you know, probably, unless we've got the same mutation, Joe."

Breden started to say, "I'm not a mutant—" but then something stopped the words in his mouth and a thought like a bright light burst into sudden radiance in his mind. Imperceptibly, while the thought blazed, he hesitated. Then it died down again and he went on uncertainly, "But . . . what was it, then? What is it? I could bring myself out of hypnosis . . . I knew exactly what I wanted to do—"

Inside his brain a voice was reminding him of many small things whose sum he could not yet read. What the doctor had been about to say when he died—had he guessed then something more than the simple fact of hypnosis? The altered genes in the bodies of Breden's parents—the constant assurances he had accepted for so long, that he at least was no mutation—

Louis said, "Maybe I can tell you the answer, Joe. There's one probability world where instinct has become the dominant. Instinct riding on the back of intelligence and guiding it. Instinct . . . well, that's our word for whatever the thing may be. Inadequate, of course. Something away beyond the tropisms and the taxis that rule plants and insects, but—"

"And I've got it?" Breden asked impatiently.

"I think so. It's never happened here, but the latent factors were always present. You're a mutant after all, Joe—but it was a latent mutation, until now."

"How do you know?"

"I don't. I'm guessing. But I've got premises to guess from that nobody else knows about. I've been seeing these other worlds—"

Jeng was watching and listening, his round face impassive, his eyes bright. De Anza, looking stubborn and bewildered, held his weapon unwavering. Breden's grip on his own weapon was firm, but there was a note almost of pleading in his voice as he said, "Go on, Louis. If this is instinct—"

"Actually it's something a lot more subtle, a sort of higher reasoning, from the evidences of senses below the threshold of conscious perception. They know something about it, but not all, in that world where it's dominant. Maybe it's clairvoyance, or prescience, or psycho-kinetic deductions, or—I don't know, Joe! Whatever it is, something's made it dominant in you. Maybe the hypnosis, or the psychological stresses. All I can say is that now you need it, you've got it. What's really important is what you do with it."

Breden said, half to himself, "I knew just what to do—I still

know—" And he leveled his rod-weapon at Louis.

"That's self-preservation," Louis said quickly. "What about the other angle—preservation of the species? Will killing me solve that problem too?"

Breden said, "Talk, Louis. Let's have it fast."

Louis let his rod fall to the floor. He took a step back and leaned against the wall.

"Jeng," he said, "you listen, too. I know more about what you want to do than you know. The Freak can see and understand a good deal, but he hasn't had the experience to perform a screening process. I've been in rapport with his mind all the time I've been here, unconscious. His memories, his vision—Omega, and the other worlds. The world where instinct's dominant — and that worked out very successfully. But it took controlled eugenics to bring it about. The worlds of war, and of Nirvana, and the worlds that died. I don't know how many there are. Some are too far away to see clearly. There must be many further still. But—here it is: I'm a mutant, and the Freak's a mutant. He's never been in contact with another mutant before this, has he?"

"Your brother," Jeng said. "If he is one."

"Perhaps telepathy isn't one of Joe's traits," Louis said. "Apparently it is one of mine. All the while you've kept me under drugs I've been in close contact with the Freak's mind. I'll tell you what threw him into shock. His father attacked him. And what set Ortega off was something the Freak said. The Freak can see probability variants. He can't see backward and forward in time, but he can see across the probability track where it intersects the other worlds along the NOW-line. In one of those tracks the earth doesn't exist. A chain reaction destroyed it."

Through the underground room a ripple of panic moved silently.

Louis went on.

"The time-tracks branch, all through the past. Whenever a crisis occurred, there was usually a crossroads, and the result was two probability futures instead of one. Some have spread out too far to be visible now, even through the Freak's eyes, or with the inter-probability machine Van Buren made in Omega. But others can be seen. There were a good many crossroads a hundred years or so ago. Some were war tracks, others were peace tracks—like ours. In one the United States gave the UN a year to work, and propagandized Russia's spheres of influence. That branched too: in one probability we conquered Russia, in another Russia sovietized the world. And *that* branched too. In one NOW, Russia still rules; in another the rising tide of mysticism and passive resistance from India and China have disrupted Russia from within.

"But only in two worlds is GPC in control. Alpha and—we'll call it Beta. It's very close to us; the crossroads occurred not ten years ago. It hasn't gone very far away

from us yet. Except that ten years ago a new germ mutation occurred in Beta. There were no research facilities there, either. Beta is dying—of plague," Louis ended quietly, "because it was too late to do the necessary research to save it."

The monologue had gone beyond De Anza. He merely watched and listened. But Breden and Jeng were intent.

Jeng said, "In one probability there was a chain reaction—a fatal one? But Van Buren says that's impossible."

"Van Buren, in Omega, depends on a mechanical scanner. The Freak's brain has a wider scope. He can see further across the probability lines. Van Buren doesn't know. I've seen his world through the Freak's mind—" Louis turned to his brother. "Joe, listen to me. We can communicate with Van Buren. I know how to do that. I've picked up that knowledge from the Freak's brain—Jeng couldn't, because the symbols he got from Van Buren were arbitrary and oral. But I *saw* the machine Van Buren built, as the Freak saw it. One part is missing. We can't make that part—a deflection plate—without a radioisotope, but we don't need to. Van Buren used that sort of plate because he had it available. He could have used a less efficient, more complicated hookup, but he didn't need to. We do. I can tell a technician how to rig it. At least, I can sketch it out."

"Technician?" Jeng said, looking at the body on the floor.

"De Anza could do it. Joe, you could do it. But—you've got to make your decision. I've made mine. I've always been a freak in this world, myself. I know that now. There was no freedom—intellectual freedom, I mean. I was rusting, playing with kid's toys. So were you. What does guarding Uranium Pile One mean? Upholding the *status quo*—but I saw the result of that in Beta!"

Breden hadn't lowered his weapon. "Destroying the Uranium Pile would mean . . . might mean destruction of the planet."

"It happened only once, in another probability. Why didn't it happen in any of the other probabilities? Why not in Omega, where they've harnessed atomics for years? What does your instinct tell you about that?"

Jeng said suddenly, "It seems to me that your brother must make a choice between two drives—self-preservation and preservation of the species. If he chooses the first he'll kill me—and you too, Louis. But if he chooses the second—"

"He'll choose the second," Louis said, "if his instinct is the same one I saw working on that other world. It wouldn't have become dominant there and succeeded unless it perpetuated the species."

Breden said, "Louis. In Omega—have they really cured cancer?"

"I saw no cases there," Louis told him. "And that's rather my field. I don't know, of course.

But through the Freak's brain I saw their medical technologies and —I think they have."

De Anza cried out suddenly.

"Joe! What is it they want you to do?"

No one answered. Perhaps it was conditioning that lifted De Anza's weapon and aimed it at Jeng. For Mike De Anza fitted in this world, in the *status quo,* and his mind had already crystallized, though he was younger than Louis or Joseph Breden.

Perhaps it was conditioning that made him try to kill Philip Jeng.

But it was instinct that kept Breden silent, though he knew that behind him Ilsa Carter had come quietly in, until her energy weapon smashed home into De Anza's brain.

Crossing that blast, a beam shot out from Breden's rod toward her. But it was a beam to stun, not to kill, and it struck only her wrist above the weapon. Ilsa's rod tinkled to the floor with a sharp, clear sound above the sliding and the thud of De Anza's body. She stood staring at them, clutching her paralyzed wrist.

Breden said, "Wait, Ilsa. Louis —wait. I've made my decision. I let you kill De Anza, didn't I?"

"But you didn't see me," she said. "Your back was toward me."

"I didn't need to see you. I knew how hard I'd struck you. I knew exactly when you'd wake up and what you'd do. I could tell . . . instinct, I suppose. It's useful, sometimes. And—I liked Mike, too. He's luckier than we are, at that—not having to face the reorganization that's coming."

Jeng was impassive. Louis said, "Then it's preservation of the species, after all?"

Breden said, "I don't know. I really don't know. Perhaps it's the unconscious conditioning I've been having for months—the recurrent dreams—you don't know about those. I only know that, somehow, I'm working on the other side now. My job was never really important to me, though I thought it was. I never had a chance to . . . to—"

Louis smiled. "To surpass me?"

"Yes," Breden said. "That was it, of course."

His brother nodded. "I was trying to surpass somebody too. Somebody I thought didn't exist. The man I might have been, given intellectual freedom, in a different set-up. Maybe I can accomplish some of that now, but I'm afraid too much of me may have got stultified—even if we prolong longevity here and I live for two hundred years. Go on and try to surpass me, Joe—and good luck. I'll be trying the same game. Trying to surpass the man I might have been—" His gaze went to the machine behind Jeng. "John Van Buren," he said. "If I'd been born in Omega—or if this world's past had been different—"

Breden was looking down at De Anza's body. "Intelligence and instinct—or whatever-it-is," he said. "But what about emotion? There's no time now. We've got to find a way to talk to Van Buren. Louis,

what about that hookup you said you could explain?"

They began to work.

They succeeded.

Oral communication between two cultures must be handicapped semantically. But now there was visual communication as well, with Louis using the Freak's brain as a library. Van Buren still could not touch the Freak's mind, in shock as it was, but Louis could touch it and read the memories. Basically it was a reference library for him. As for the two-way communicator, Joseph Breden was technician enough to make sense out of Louis' charts and explanations. So, in the end—

Communication was opened, and they talked together—Omega and Alpha.

"Your world is Alpha, then," Van Buren said. "To use arbitrary symbols. My world is Omega. Those two diverged not quite a hundred years ago. There are apparently a great many other probability-variant earths, but only two of them are close to yours—Alpha. Beta-earth diverged from yours ten years ago, when the germ-mutations got out of hand. I can't reach them, because there's no Freak to establish the initial rapport. Then there's Gamma-earth, which diverged from yours thirty-five years ago, when a uranium pile accidentally reached crucial mass."

"I saw it," Louis said, but Jeng leaned forward.

"Was that the earth that was destroyed by the chain reaction?"

"Oh, no. Gamma's still very much in existence. A uranium pile can blow off without wrecking a planet. There was a hundred-mile radius explosion on Gamma, that's all. The important thing is that there was a social explosion, too. The various rebellious elements like the Neoculturalists—they existed on Gamma, too—began to rebel. GPC's superiority had depended on *status quo,* the stability of the uranium piles. People assume that a policeman has authority and will protect them, but if the policeman's gun is proved not only useless but dangerous to innocent victims—well, there was chaos on Gamma, and then anarchy. GPC fought for its life and lost. It was dog eat dog. GPC had moral superiority and weapons; the first vanished when the uranium pile blew up, and it isn't hard to make weapons. So there was atomic warfare again, decentralization—as on our world, long ago—and then germ warfare. Now they're beginning to rebuild on Gamma. They'll have time. They've already extended their life span considerably, and that means their research men will get a lot better as they acquire more experience—hundreds of years of experience, probably."

"Have they cured cancer?" Breden asked.

"Some forms. It mutates, you know. We—"

"Have you a cure?"

"Yes. Whether or not our mu-

tated strains are the same as yours—"

Louis asked quick questions, and emerged with a doubtful frown. "We might be able to do it," he said.

Van Buren said. "Cancer isn't incurable. Given a research fund and skilled men, you can find a cure fairly easily."

"Wait a minute, Joe," Louis said. "Don't count too much on this yet. I said we *might*—but not yet."

"Why not?"

"Time and equipment. It takes months to grow penicillin, and you need power and equipment—X ray, ultraviolet, and so on. Insulin's a specific for diabetes, but you need an industrial plant to get it from the pancreatic glands of dead animals. Look. Omega's a hundred years or more ahead of us, and it's got the time and the facilities for these things. GPC has some of the facilities, but won't permit research, and I think GPC's time is running out. Research depends on stability."

"GPC's got stability," Breden

said doubtfully. Jeng glanced at him.

"Has it?" he asked.

"You can use a magic wand," Louis said, "but first you've got to make the wand. We'll be able to cure cancer, but Van Buren's specific won't be any help till we can produce it."

And, after a time—

"But one earth was destroyed by the chain reaction, Van Buren," Jeng said. "What about that?"

"I've been considering that since you told me. I hadn't seen that particular probability before. But—"

Louis broke in, and there was a period of technical discussion, from which one factor emerged triumphant. Van Buren said, "Yes, I believe that must be it. In some probability earths there have been artificial radioelements created—there are plenty besides the uranium isotopes, of course. In some of the worlds I've seen—right, Louis?—they work with radioelements we've never created on Omega. On that destroyed planet they must have created an element so powerful and unstable that the chain reaction could and did vaporize their world. But here in Omega we work daily with all the radioactive elements you have available, and the safety factor on all of them is known. Destroying your Uranium Pile Number One will make a big noise—but not big enough to do more than smash GPC."

"If I can get near Number One," Breden said.

Louis studied him. "You've got a new weapon, Joe. Your instinct, or super-logic, or—whatever it is. You've enough motive, enough drive, to keep it in operation. You'll instinctively know the right thing to do."

"Yes," Breden said, "I'll *know*, all right—but what about physical limitations? I'm not a superman."

Ilsa said, "Van Buren, can't you explode Uranium Pile Number One from your world?"

"Yes," the voice from Omega said, "I could. But it would destroy both our planets. That's why I can never visit your world, or you mine. I told you the energy potentials of our continua are too different. If a channel were opened, they'd equalize—and the difference in voltage is rather inconceivable. The higher-voltage continuum would drain into the lower one instantly, and at the point of contact—there'd be neither Alpha nor Omega. Even a few volts difference would mean a big bang—a release of energy that would make quite a noise—and there's more than a few volts difference between your universe and mine. I think it depends on Joseph Breden."

Breden looked at his watch.

There was no need for hypnosis now. His new-found recessive talent, become dominant, guided him. The spark in his brain, the infallible instinct, pulled him through the psych tests.

It was not easy. It was gruelling. All the while Dr. Hoag and

the others worked with him, he was thinking of Carolyn Kohl, and wondering if that part of his dream would come true. He wouldn't shoot her; he had no weapon. But he would have to silence her in some way.

Automatically, instinctively, he reacted properly to the tests.

"Why did you pull your arm out of the shot box before the neutralizing agent was administered?"

"I didn't. I felt the shot." He knew that was the right answer to give.

Hoag talked to the others. "Suggestion? After all, there's the booster dermal anaesthetic. He was expecting to feel the needle . . . no, not pain, simply the tactile sensation—"

Margaret. They were on the same side now, fighting together, and that was as it should be. He hadn't seen her; he'd gone directly to New York, and thence to the island where the sunken ziggurat was, guarding its monstrous treasure. Beneath him he could sense the silent, thundering pulse of the thing. Uranium Pile Number One.

He had not touched a damper yet. But as he moved steadily through the psych tests, he felt the energy-level rising toward critical mass. Not really; it would not register on any instrument. Yet when he reached the Thing—

It throbbed!

Bridging the synapse between brain and monster, the illusory sensation leaped.

It pulsed!

And then, suddenly and unexpectedly, Dr. Hoag was saying, "Well, Breden, I guess that's all. Take over."

Breden smiled. *"Summa cum laude?"*

"Sure," Hoag said. "Better get along, or you'll be late." He settled back in his chair, and Breden, nodding at the other members of the Board, got up and went out. He walked along the blank corridor and stepped into the elevator.

He touched the control. His mind was moving very swiftly, not planning ahead—he would depend on instinct for that—but weighing possibilities. He wondered how the instinct would direct him—that infallible instinct that was his own mutation. And Carrie? He hoped he wouldn't have to kill her, as, really, he'd killed Mike De Anza. But she was like Mike, after all, one of the people without drive, a person to fill a routine job capably, but never one who should be trusted to guide or plan new things. She had crystallized; she was satisfied. The fact that nuclear physics was her field didn't indicate that she was imaginative; routine nuclear physics was no longer an adventure. But other adventures existed—

Instinct warned him. The elevator was moving up, not down. Suddenly Breden's hands flashed across the controls, deftly disconnecting, rewiring, plugging—

And, as suddenly, the instinct failed.

The panel slid open. He saw a

bare, blank corridor ahead. He walked along it, slowly, watchfully.

And stepped into the cabin of a helicopter. Behind him the plane's door shut. He stood there, waiting, as the copter began to rise.

He listened to the voice of his new instinct.

Dr. Hoag suspected something.

The psych tests had made the Board suspect. Not all, but enough. There was no way to outwit them—no way at all. The fight's lost. They maneuvered you out of the ziggurat cleverly. From the moment you entered Hoag's office, your path to the uranium pile was blocked and barred. They took that precaution. If you'd passed the tests—but, after all, you didn't. Instinct can do only so much. This world is based on reason, not instinct. And when you're up against a machine that's simply too big for you, you fail.

So they suspect you now. You'll never be allowed on the island again. You'll be investigated, checked—made to talk. You will talk, under drugs. Instinct won't help you then—if that's what this wild talent is. Because compromise will be logical, since GPC will infallibly win. The underground movement depended on you, and you failed. So the future will be GPC's. Compromise is the answer. It will preserve your life and the lives of Margaret and your child. GPC will question you, find the truth—and cure you, condition you until you are a GPC man again.

In the probability-world where instinct, or whatever-it-was, had been eugenically bred into the race and the planet molded to fit that, you'd have fitted too. But not here. Not in Alpha. You'd be marked out, a freak, and a dangerous one, to be eliminated. This—instinct—proves that the only answer for you now is—the instinct must become recessive again, instead of dominant.

And the instinct—became recessive.

But it was not infallible. It worked on the logics of one probability plane only. An hour later John Van Buren's voice said over the transmitter:

"He's in Chancery now. They're beginning to question him. He's under drug-hypnosis."

Ilsa, Jeng, and Louis Breden were listening. Behind them, in the tank, the Freak floated without a movement. Ilsa stood up and began to march back and forth.

"If we could act—!" she said.

Jeng said, "While the uranium piles remain below critical mass, we can't hope to accomplish a thing. I think we'd better disperse, for a bit."

Ilsa said, "A suicide plane, diving at the ziggurat—"

Louis said, "You know that's no good. A plane would be detected and shot down. Besides, even if you hit the ziggurat, it wouldn't do any damage. Don't you know how the thing's constructed?"

Jeng said, "My integrations are finished, until a new factor enters. Our Plan Z-15 is ready, but it depended on Breden's destroying the uranium pile. The cells of our or-

"Help me *walk* again..."

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ganization are ready to act. They can't hope to conquer, but they could have triggered the anarchic movement. Except—Breden didn't succeed."

There was silence. Van Buren said, "GPC is making him talk. Under hypnosis, he's vulnerable."

"What about that instinct of his?" Ilsa asked sharply. "Doesn't that tell him he'd better keep quiet?"

"Instinct, prescience, super-logic—perhaps it's wiser than we are," Jeng said. The girl turned toward the door.

"I'm going to have a try, anyway," she said. "What else is there to do?"

"Have you any bombs?" Jeng asked. "Well, then. It's futile."

"So you're giving up?"

"No," the Tibetan said with placid patience.

Louis said, "Van Buren, can't you see any way out? Isn't there anything we can do?"

Van Buren said, "I'm sorry. Your world is psychopathic. Perhaps no psychopathic patient can ever really cure himself. The cure must be administered from outside—but I can't come into your world, and my weapons wouldn't work in your continuum anyway."

Ilsa said violently, "Then open the channel between Alpha and Omega! It's better to destroy our earth than have it work out the way it did on Gamma."

"That would destroy my world too," Van Buren said.

"Well—open the channel between us and Gramma," Ilsa said. "This whole planet's become expendable by now. Nothing can cure us—you can't, and we can't—"

Louis Breden said abruptly, "Van Buren! What about that? Could you bridge the gap between Alpha and Gamma?"

"Yes."

"At any geographical point on either earth?"

"Yes."

"What's the voltage differential between Alpha and Gamma?"

"Too much to be safe. The two earths diverged thirty-five years ago—"

Jeng said softly, "What is the difference in energy potential between our world and Beta? That divergence occurred only ten years ago."

"Two volts, perhaps," the voice from Omega said. "There have been equalizing factors that maintained a fair balance. Exactly. I could channel the potential between Alpha—your earth—and Beta, and it would make a big noise. Not big enough to destroy a planet, or even an island, but—"

"Channel the energy potential between somewhere on Beta, and Uranium Pile Number One here," Louis said. "Then?"

"Then critical mass would not be reached," Van Buren said. "But I could destroy the controls—which would do as well! That would be safe—except for the danger area about that island. Very well. It will take me an hour, perhaps. Make your plans, Jeng. I'll begin the work."

It pulsed!

The monster's heart beat thudded

rhythmically through the sunken ziggurat, undetected and unnoticed.

Carolyn Kohl and her new co-guardian played tri-di chess, glancing occasionally at the gauges that told them nothing.

That was on Alpha.

On Beta, the virus- and germ-mutations raged unchecked, scourging a world falling into chaos, where GPC clutched vainly at the reins rotting in its grasp.

On Omega, John Van Buren jury-rigged his machine.

On Alpha, in Chancery, GPC's best-qualified men were questioning Joseph Breden and moving the precision machinery of their police controls into swift action against the underground.

And in the ziggurat the monster crouched like a cancer, a tumor that could have been benignant, but had instead grown into a malignant sarcoma in a hundred years. Like the two tumors within the body of Margaret Breden—the benignant one in her womb, and the latent, malignant cancer filtering through her blood.

The psychopathic world lay waiting, unsuspecting, while Van Buren prepared his electric shock therapy.

No patient can cure himself. But a shock from outside—

Van Buren made the last movement necessary.

The channel opened between Alpha and Beta. The energy potentials of two probability-continua, no longer insulated from each other, met—and leveled.

Only two volts difference—but enough to bring Uranium Pile Number One to critical mass.

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In his tank, the Freak opened his mouth and screamed.

Six weeks later Louis Breden sat before the transmitter, talking to Van Buren. Now, more than ever, the organization needed Van Buren's advice. Too much had happened—more than they had expected; but the man in Omega seemed unperturbed.

"Things are working out," he said. "We have the other probability world for purposes of comparison. You say that germ warfare is already beginning; that's the natural progression."

"I hope we survive it," Louis said.

"Enough of you will. Drastic ills . . . enough of you will."

"Ortega didn't."

"But already you've found a specific for his coryza-variant virus," Van Buren said. "You could cure him now, if he were alive. And you're curing others."

It was true enough. Some died, but others would survive, sometimes the unexpected ones. The Freak had not only survived, but had been cured, brought out of his shock stupor and into complete rationality. He had somehow sensed or felt the atomic blast at the island, and had realized that this world, at any rate, was not doomed to destruction by the chain reaction. There was another earth that had been so destroyed, but apparently through use of a different, unstable artificial element or isotope. The Freak was cured, and was proving extremely useful, though he was still bound to his tank.

Yet Ortega was dead, a victim of the mutated coryza virus. And the world was in chaotic anarchy. Decentralization had happened weeks ago. GPC was now only one of a dozen groups that strove for power. And through the struggle weaved the forces of the underground, not yet ready to reintegrate, deftly turning the kaleidoscope whenever it showed a tendency to settle into the wrong pattern.

Ilsa Carter was still alive and useful. And Joseph Breden was alive too—in the confusion, it hadn't been impossible to arrange his escape from the Chancery of the bewildered GPC. He, too, was helping, finding some release for his talents, though not until peace came would they find their full scope. And Margaret was alive also, in a hideaway in the Rocky Mountains, nursing a baby girl who seemed perfectly normal and nonmutant.

The shock treatment had worked. Now, perhaps, it was the stage of pentothal narcosynthesis—the patient was undergoing katharsis.

"I'm on the trail of that longevity thing," Louis said. "We don't have the facilities yet, but we'll get them. However, the main thing for us now is to find protection against the coming biological attacks."

"Being able to see the other probability-worlds will help," Van Buren repeated, and Louis, eying the blank wires of the transmitter, nodded. He was trying to visualize Van Buren's face as he had seen it in the Freak's mind. It was a face much like his own, but there were differences. Within the last month, rather

oddly, Louis' expression had changed so that the resemblance was very marked—to the few who could make the comparison. Yet a basic difference would always remain. For Louis it would always be a little too late. He had a chance now to catch up, and there might be more of a chance later, if the longevity genes could be maneuvered satisfactorily.

The Freak called Louis telepathically. Both Van Buren and Louis slipped into the Freak's mind, and saw, with his strange, intra-probability vision, an earth they had not glimpsed before, far beyond the scope of Van Buren's mechanical scanner.

"A nice world," Louis said inadequately. "So will ours be, some day. That one took the right route at some crossroads—I wonder when?"

"There are so many crossroads, Louis," Van Buren said. "There are the major ones and the minor. I think our major one was in 1945—we'd probably never have dropped the atomic bomb on Hiroshima if the Jap kamikaze fleet hadn't destroyed Washington."

Louis said, "We might have. We've always been a sentimental nation—but we might have done it, just the same."

"I hope not. We needed destruction in our own country to be able to understand it. You can't convey war to a nation through words or pictures. And we needed that bombing—or we'd never have respected atomic power enough to keep it under control. We had to make a decision and stick to it, not keep on compromising with politics and anachronistic social shibboleths. There were plenty of probability crossroads a hundred years ago, but I think the most important one was the Washington-bombing factor. There were earths where Washington wasn't bombed!"

"Yes," Louis said, his thought escaping unfinished in the blaze of an incandescent memory that would always be blinding, no matter how often it returned to him. *It was the earth once.*

Van Buren said, "We can tell, now, what happened to some of those earths, and what roads they took. Well, some of them haven't turned out to be failures. For others—it's too late. It was too late for them a hundred years ago."

Louis forced his mind away from the shining horror of a memory. "*All our yesterdays—*" he said.

"*. . . Have lighted fools the way to dusty death.*" Van Buren finished the quotation. "No, Louis—not all. The ones that did—well, they stood at their crossroads and were given a fair choice. And they committed suicide. So forget about them—they're not important now."

Louis said, "Man got used to being given another chance. But there's no second chance with atomic power, is there? The failures—"

"It's already too late," Van Buren repeated. "They don't matter any more."

THE END.

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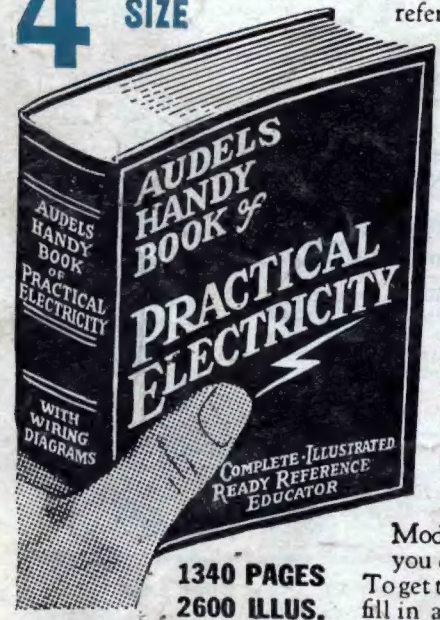
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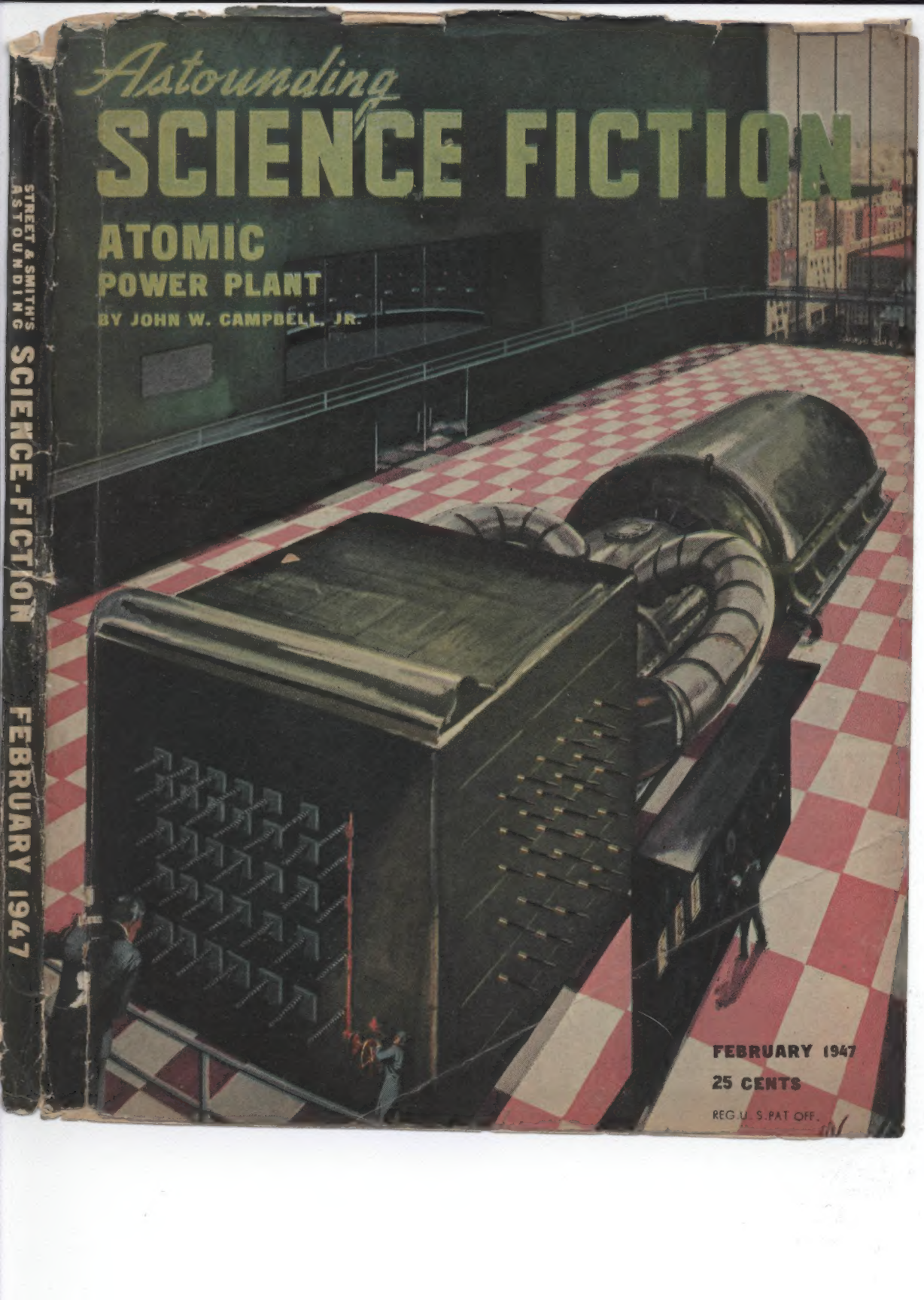
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